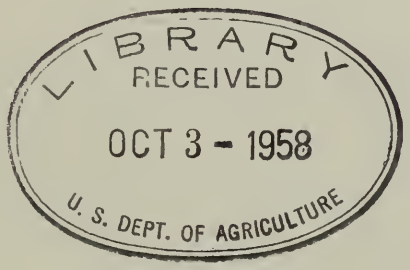
ST. FRANCIS RIVER AND TRIBUTARIES PROJECT

(MISSOURI)

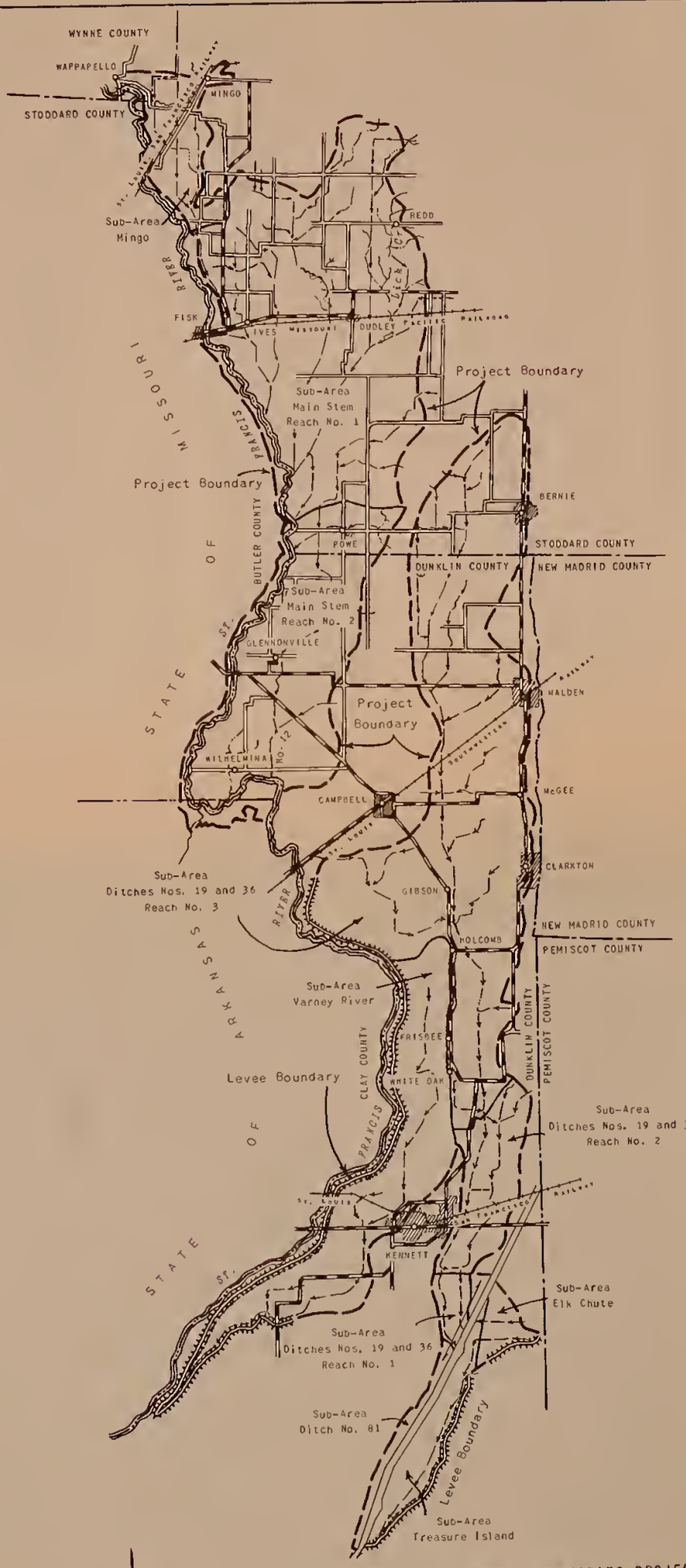
MISSISSIPPI RIVER AND TRIBUTARIES PROJECT REVIEW

REPORT ON PRESENT AND ANTICIPATED AGRICULTURAL CONDITIONS



Prepared by the
U. S. Department of Agriculture for the Mississippi River Commission

Soil Conservation Service
Columbia, Missouri
June, 1957



ST. FRANCIS RIVER AND TRIBUTARIES PROJECT

IN DUNKLIN, NEW MADRID, STODDARD AND WAYNE
COUNTIES, MISSOURI AND CLAY COUNTY, ARKANSAS

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
COLUMBIA, MISSOURI

REFERENCE

CARTOGRAPHIC APPROVAL | TECHNICAL APPROVAL

COMPILED	TRACED	CHECKED	DATE
	J. E. L.	G. L. B.	1-7-61

4-R-11,309

AUTHORITY

This report has been prepared by the Soil Conservation Service, U. S. Department of Agriculture, covering studies made under authority of Section 6, Public Law 566, 83rd Congress and upon request of the Mississippi River Commission. The basis for study was agreed upon as set forth in the Project Study Statements dated July 9, 1956 and September 13, 1956 respectively for St. Francis River and Tributaries and Little River Project.

AGENCY PARTICIPATION AND RESPONSIBILITIES

Material contained herein is based upon the data at hand and the combined judgment of agricultural technicians most familiar with the project area and its agricultural conditions and problems. Under a U. S. Department of Agriculture Memorandum of Understanding, consummated February 2, 1956, the U. S. Forest Service, the Agricultural Research Service and the Soil Conservation Service have each participated in the study. From time to time assistance from other persons, such as representatives of the Agricultural Extension Service, State College of Agriculture and Experiment Stations, and other agencies, has been given.

The Agricultural Research Service has been responsible for furnishing field crop and livestock commodity price data, field crop and livestock enterprise production cost data, and interest rates for capitalization, amortization and discounting; it has assisted the Soil Conservation Service in studies of field crop and pasture yields and in overall economic procedures.

All woodland yields, values and costs were developed by the U. S. Forest Service.

The Soil Conservation Service, through the office of the Missouri State Conservationist, has in general been responsible for coordinating and conducting the study and preparing this report. It has classified the soils of the area, in accordance with a legend used throughout the Mississippi River and Tributaries study area. In accordance with the major soil groupings, it has estimated land use and cropping patterns, extent and cost of land use conversions, and extent and cost of farm and group drainage systems.

METHOD OF COMPUTING AGRICULTURAL VALUES CREDITABLE TO THE PROJECT

Data presented in this report are intended to portray three different situations with respect to land use, cropping patterns, crop yield and etc. (1) the current situation, (2) the future situation without the proposed project, and (3) future conditions with the proposed project. The basis for computing agricultural benefits in this report is the difference in crop values between the second and third situations listed. The major reason for this type of calculation is that it provides a systematic means of excluding non-project influences which are expected whether a project is constructed or not. Because of current land development operations and expected changes in commodity price and price-cost relationships, for example future land use and cropping systems, without the project may be quite different than the present. This difference is not credited to the project.

LIMITS OF APPLICATION OF ESTIMATES

The estimates cover an appraisal of the agricultural values and costs that can be expected as a result of agricultural drainage in association with installation of the proposed project works. However, the data include no estimates of flood damage reduction values or costs, though the land use and cropping estimates reflect the flood protection that would be afforded by the proposed project works. Average flood-free yield estimates have been used throughout the study so that they can be used as a basis for calculation of flood damage reduction by the Corps of Engineers, based upon its own hydrologic studies. The Department of Agriculture, having made no hydrologic studies of its own in the area, has developed estimates on the basis of hydrologic data provided by the Corps of Engineers, including the delineation of limits of project effectiveness and maximum overflow that established the conditions for project study. Further studies could result in revised hydrologic data that would require modification of the agricultural data contained herein.

DESCRIPTION OF PROJECT

This project study area extends from the northwest corner of Stoddard County southward through Dunklin County to near the Arkansas line; also included is a small area of Clay County, Arkansas. Crowleys Ridge has been excluded from the study area. The study area has been broken down into the following sub-areas:

Mingo, Main Stem No. 1 and Main Stem No. 2

These sub-areas are located in the extreme northwest part of the project study area, beginning at the spillway of the Mingo National Wildlife Refuge. They extend eastward to the foothills of Crowleys Ridge and southward to just below the Arkansas State line, including a small area in the northeast corner of Clay County, Arkansas. The west boundary is the authorized east bank levee from Wappapello Dam to Fisk, Missouri, (U. S. Highway No. 60) thence southward following the west bank levee to the Arkansas line. (see map)

The project consists of St. Francis River channel improvements and realignment from Fisk to Crowleys Ridge. It also consists of major drainage improvements to the entire length of Mingo Ditch from the Mingo National Wildlife Refuge south; Dudley Ditch from St. Francis River to intersection with Lick Creek, Ditch No. 12 and extending up Lick Creek, Ditch No. 12, to a point about two miles above U. S. Highway No. 60; Main Ditch (Drainage Ditch No. 12) from St. Francis River north to intersection of lateral No. 1 about 2½ miles northeast of Glennonville, Missouri.

The proposed project is designed to serve as major outlets for farm drainage systems for a total area of 113,918 acres, and provide additional capacity for adjacent upland drainage.

For the purpose of evaluation, the Corps of Engineers has subdivided these areas into three zones relating to flood reduction and drainage benefits. The A Zone, a zone of drainage benefits calculations only; B Zone, is a zone of flood reduction and drainage benefits calculations; C Zone, is a zone of no project benefits.

These sub-areas are principally agricultural in nature, and benefits that can accrue from the project will be almost entirely by the provision of adequate outlets for farm drainage and flood abatement in the B Zones.

General farming predominates in these sub-areas, with corn, cotton, soybeans, and hay and pasture as the principal crops. On a comparative basis of other study areas in Missouri these sub-areas are considerably lower in productivity and productivity potential, due to the predominance of inherently poor soils and consequent low level of management.

Ditch Nos. 19 and 36, Reach 3; Ditch Nos. 19 and 36, Reach 2; Varney River

Sub-areas, Ditch Nos. 19 and 36, Reaches 3 and 2, extend from a point about four miles north of Bernie, Missouri southward to a point about two miles southeast of Kennett, Missouri. The east boundary parallels the Dunklin and New Madrid County lines, from about ½ to 1 mile west of this boundary. The west boundary is formed by Crowleys Ridge and the east bank levee of the St. Francis River. (see map)

The project consists of major drainage improvements. This proposed improvement on Ditch Nos. 19 and 36, Reaches 3 and 2, extends from the intersection of Dunklin County Highway "J" and Ditch 19 southward to the junction of Ditch Nos. 19 and 36, which is at the south boundary of sub-area Ditch Nos. 19 and 36, Reach 2. The proposed improvement on Varney River extends from the junction of Varney Ditch and Shipley Slough (about ½ mile south of Missouri Highway No. 84) southwesterly, to its confluence with the St. Francis River.

The proposed project is designed to serve as major outlets for farm drainage systems for a total area of 114,983 acres and provide capacity for additional drainage from Crowleys Ridge into Ditch Nos. 19 and 36.

For the purpose of evaluation the Corps of Engineers has subdivided these areas into two zones, relating to flood reduction and drainage benefits. The A Zone is a zone of drainage benefits calculations only; B Zone is a zone of flood reduction and drainage benefits calculations. There are no C Zones in any of these sub-areas.

These sub-areas are entirely agricultural in nature and benefits that can accrue from the project will be entirely by the provision of adequate outlets for farm drainage and flood abatement in the B Zones.

General farming predominates in these sub-areas with cotton, soybeans, corn, hay and pasture as the principal crops. Melons are grown rather extensively on the sandy soils of the Varney River sub-area, and to an insignificant extent on the other two sub-areas.

Ditch Nos. 19 and 36, Reach 1; Elk Chute; Treasure Island; and Ditch No. 81

These sub-areas are located at the extreme southern end of the entire study area. Ditch Nos. 19 and 36, Reach 1 begins

about two miles southeast of Kennett, Missouri at the southern boundary of Reach 2, Ditch Nos. 19 and 36 and extend eastward to the west side of the battery of large ditches of the Little River Drainage System. Ditch No. 81 is the most westerly ditch of the battery of the Little River System. Ditch No. 81 sub-area begins at the north end of Reach 1 of Ditch Nos. 19 and 36 sub-area and extends southward to the railroad bridge at Hornersville, Missouri and includes a small narrow area (less than $\frac{1}{2}$ mile wide) on the west side of Ditch No. 81. A small area adjacent to the southern boundary of Reach 1, Ditch Nos. 19 and 36 is excluded from this reach. This exclusion, which is included as a part of Reach 1, divides sub-area Ditch No. 81 into two separate segments. Elk Chute and Treasure Island sub-areas are on the east side of the battery of ditches of the Little River System and extend the same distance along the east side of the battery as Ditch 81 sub-area. The eastern boundary follows the Elk Chute levee northeastward to the Dunklin, Pemiscot County lines, thence in a northwesterly direction to its intersection with Ditch 259 of the Little River Battery System.

The proposed project is designed to serve as major outlets for farm drainage systems for a total area of 12,851 acres.

For the purpose of evaluation, the entire area occurs in the B Zone; a zone of flood reduction and drainage benefits calculations.

These sub-areas are entirely agricultural in nature, and benefits that accrue from the project will be entirely by the provision of adequate outlets for farm drainage and flood abatement. The proper functioning of the proposed project is contingent upon the completion and maintenance of proposed outlet facilities for the Little River Drainage System. These proposed facilities are located in the State of Arkansas in the vicinity of Big Lake.

Agricultural crops grown in this area are limited almost entirely to cash crops of cotton, corn, and soybeans.

SOILS

Soils of the study area occur primarily on flat to undulating topography and range from fine textured poorly drained soils, to sandy excessively drained soils. From a soils standpoint, the area can be roughly subdivided into three significant zones.

(1) The upper area, west of Crowleys Ridge (Mingo, Main Stem No. 1 and Main Stem No. 2) - This area is almost entirely medium textured, poorly drained soils. Roughly, 2/3 of this upper zone is rather low lying, silty, poorly drained bottomland and second bottomland soils. Topography is undulating to nearly level with numerous depressions and old meandering channels.

(2) The northern and major part of the project area east of Crowleys Ridge (Varney River and Reach 3 of Ditch Nos. 19 and 36) - This is an area of mixed soils, ranging from sandy excessively drained soils to fine textured, poorly drained soils. The southern $\frac{1}{4}$ of this area has well drained silty soils on a rather high terrace level on about 65% of the area and silty and fine textured poorly drained soils on the remaining 35% of the area. The remaining 3/4 of the area consists of approximately 65% sandy soils, most of which are droughty and excessively drained but a portion being low lying swales and poorly drained. In addition to the sandy soils, poorly drained fine and medium textured soils occur.

(3) The remaining southern and eastern most part of the area east of Crowleys Ridge and St. Francis River (Ditch No. 81, Treasure Island, Elk Chute, and Reach Nos. 1 and 2 of Ditch Nos. 19 and 36) - This area is almost entirely poorly drained fine textured soils intermingled with sand spots and sandy streaks. Occasional moderately sized areas of sandy, excessively drained soils occur but these are in the minority.

The poorly drained soils are normally the most poorly developed for agriculture production, but afford the greatest potential for increased production from drainage. Surface drainage and adequate outlets for farm drainage systems are needed. The well drained silty and sandy soils normally occupy areas of higher ground, with wet swales and depressions occuring frequently. Wind erosion and inadequate soil moisture holding capacity are a problem on the sandy excessively drained soils. The well drained soils as a group, normally are more highly developed agriculturally and are adapted to a wider range of crops than are the heavier soils. One noticeable characteristic of the soils of the area in general, is the complexity of the soil pattern. Large areas of uniform soil are rare and small areas of soil variations not shown on the generalized soil map occur in nearly all soil delineations.

Eight soil units have been delineated on the soil survey for the purpose of the study. These eight units can be grouped for ease of interpretation into the five following groups:

A. Fine and medium textured poorly drained soils on low elevation - Soil Unit 3 (fine textured) 18% and Soil Unit 6 (medium textured) 1%.

B. Medium textured poorly drained soils on tributary streams and low terraces - Soil Unit 8 (tributary streams) 35% and Soil Unit 10 (terraces) 20%.

C. Medium textured well drained soils - Soil Unit 9 (loess terraces) 8% and Soil Unit 15 (upland loess hills) trace.

D. Coarse excessively drained soils - Soil Unit 12, 15%.

E. Wet poorly drained sandy soils - Soil Unit 16, 3%.

LAND USE

Approximately 75% of the study area is open land, 25% is wooded, and less than 1% is covered by water. A small portion of the area is occupied by the town of Kennett and Campbell and parts of several other small villages.

About 2/3 of the medium textured, poorly drained soils on tributary streams are open and 1/3 are wooded. The medium textured well drained soils, the sandy excessively drained, and the fine textured poorly drained soils are almost entirely cleared.

There is a trend toward conversion of woodland to crop use. This is taking place primarily on Soil Unit 8 and 10 where the greater portion of the woods now occurs. Improved drainage outlets and farm drainage will result in additional clearing, particularly in the southern part of the project area, until the entire area will essentially be cleared. Clearing will not be so complete in the upper project area west of Crowleys Ridge.

The woodland in the area shows considerable variations in stocking and growth rates. Red and white oaks are the predominate species.

In the area west of Crowleys Ridge, leases and ownerships currently held for hunting privileges have had an influence for better forest management and higher values in the

more southerly portions. None of the area, however, was considered to be dedicated to uses other than agriculture. The most accessible areas have been quite heavily cut over in the past few years, but with some notable exceptions, young growth stands of pole size oak have restocked the woodland areas. Where red oak is the predominating species, annual growth and consequent yield is exceptionally good. Comparison of yield figures will also indicate the better growth and quality obtained on the lower elevations where the best forest soils in the area are found. Fire and grazing damage has been a limiting factor on forest production and is most prevalent in the areas of lowest value.

CROPPING PATTERN

Cropping patterns on open land vary chiefly with the soil mapping unit and with drainage improvement of the wetland soils. For purposes of description, the St. Francis River and Tributaries Project (Missouri) is divided into two areas as follows:

West of Crowleys Ridge

The cropping pattern within this area is definitely influenced by a predominance of poorly drained soils of low inherent fertility. Corn and soybeans predominate with about equal acreages in each. These two crops are grown on about 50 to 60 percent of open land. On an area basis small grain and cotton are next in importance, in the order given. Without drainage improvement, practically no change in major cropping is anticipated. However, with drainage improvement, significant areas (about 50 to 60%) of woodland conversions are expected with more intensive use of cash crops. Expected conversions with accompanying drainage on all ultimate open land is expected to stimulate a greater proportion of existing open land going into pasture and hay crops for livestock enterprise. There is no significant difference indicated in the proportion of the various crops occurring in A and B Zones.

East of Crowleys Ridge

The cropping pattern within this area is influenced by a higher percentage of better drained soils with higher inherent fertility than found West of Crowleys Ridge. On an area basis, cotton is the predominant crop with corn, soybeans, small grain, permanent pasture, and melons following in order of importance. The majority of melons grown is restricted to the Varney River sub-area. In this area a much

higher percentage of cotton is grown in Zone B with this crop occupying about half of the open land. Corn and soybeans occupy the remainder of the area with about equal acreages of each. The extensiveness of small grain grown in the area is influenced by areas of droughty soils and the use of small grain as wind erosion control strips.

Cropping pattern for existing conditions (Table II) based on 1956 distribution.

YIELDS

Field crop and pasture yields are estimates of yields that are currently being attained or that can be expected to be attained by average producers, using a reasonable level of management, under future conditions, with and without drainage. All yields, in all project zones, are for average flood-free conditions. Within Zone B, under present, future without project, and future with project conditions, there are varying percentages of total acreage that is or would be drained. These percentages were used in computing weighted drained and undrained yields.

Computations for Zone A are only for net acreages to be drained, and since none of the acreage in Zone C will be drained, weighting was unnecessary in these two zones.

Woodland yields are based on sampling studies conducted in the area by the U. S. Forest Service. Yields are based on average growth rates applicable to the species and stand size and ages found in the area. The yields represent the units of wood products and value that will be attained on the average for the next 50 years under the level of management that can be expected to prevail, based on present findings in the study area. Board foot and cubic foot yields are computed in the working papers, but for simplicity are not shown in Table II and are expressed as a present worth value per acre in Table III.

Markets are largely confined to sawlogs and tie timbers at the present time. The area is a heavy producer of railroad and switch ties and oak construction materials. Portable sawmills are active in the area. Some veneer and speciality products find a market and the pulpwood or acid wood markets can be expected to expand. Pole size material in tree lengths is currently being shipped for furnace poles in the ore smelting process.

PRICES

Projected field crop and livestock prices used in this report were developed jointly by the Agricultural Research Service and Agricultural Marketing Service. Projected prices have been used, based on most likely expectations, and estimates of cropping patterns have been influenced by the assumption that such prices will prevail. Projected prices were developed from studies of the long-range prospective conditions of product supplies and requirements. In order to remove the effects of price support programs, and in order to reflect the economy of production in competing areas, the projections assume the eventual attainment of a relatively free market for agricultural products.

Forest product values are based on 1955 prices and are f.o.b. millyard or siding. These prices are considered to be a realistic price projection for future conditions.

The production values shown for the future without project conditions have been discounted to present worth on all increments in production and value due to application of high level management and for any time lag in the availability of products for harvest.

In evaluating the long-run aspects of deferred land development and improvement projects, the use of projected prices makes it unnecessary to restrict the acreage of "control" crops in crop income computations.

CROP PRODUCTION COSTS

Forest Products

Production costs for forest products are based on costs prevailing in the project locality during 1955. These costs are estimated to be a reasonable level for projection to future conditions. Costs cover conversion of standing timber to raw wood products at mill or siding, including a return to management, (harvest cost) and a cultural and crop management cost (preharvest) consisting of an amortized annual charge for timber stand improvement work, an allowance for management and supervision by owners, their representatives, and foresters, and forest protection. The conversion cost varies by product and per acre yield level. Preharvest costs have been treated as fixed annual per acre charges weighted by level of management. All costs of conversion of standing trees to forest products have been discounted to present worth in the same manner as production values.

Field Crop and Livestock Products

Production costs for all field crop and livestock enterprises were developed from a study of large and small Mississippi River bottomland farms. Because production costs by enterprises are not the same for large as for small farms, these costs were weighted in accordance with the proportionate acreage of land in large and small farms expected to exist in the project area under future conditions. Production costs, as used for project evaluation purposes, include all operational costs required to attain yield levels indicated in project cost tables (such as allowances for all labor, power, machinery, and materials required to produce and market the product). All farm overhead costs necessary in farm operation (except a charge for land) and an allowance for management expense, which includes an estimated amount required for the operator's management and for any employed management personnel or services, are included in the production costs.

Land charges were omitted from the cost analysis because net returns to land were being determined for conditions with and without the project features. Overhead costs include such items as a charge for buildings, maintenance and replacement of farm machinery, interest on investment, insurance, and personal property taxes. Specified production costs are all costs incurred in production and marketing of the crop or livestock. These specified costs do not include overhead and management charges. Overhead and management costs were allocated to each enterprise in proportion to the specified costs of production expended on the enterprise. Some production costs were treated as variables with yield levels attained (most harvest costs, fertilizer, poisoning, etc.) while other costs were assumed to be fixed regardless of yield (soil preparation, cultivation, and a portion of machine - picking cost). Preharvest, harvest, overhead and management costs were computed separately to derive total crop production costs.

Production costs used for projections are approximately 96% of the 1955 level of costs incurred by farmers.

Crop yields and production cost relationships are not the same for summary tables (all soils) as for the individual soils tables from which the summary tables are constructed. A small portion of this difference is statistical in nature (statistical error due to rounding to commonly used units) and can be ignored. The major difference, however, is due to the computing of both yields and production costs in the summary tables where total production and total cost of each crop for all soils is divided by the total acreage of that crop. If all costs bore a direct

(straight-line) relationship to yield, these differences, except for statistical error, would not occur. Because this situation does not exist, an entirely accurate production cost for a given yield in the summary tables cannot be read from the standard cost tables that were developed. To get entirely accurate detailed costs (preharvest, harvest, overhead and management) in the summary tables that would be comparable to the costs used in the individual soil unit tables, it would be necessary to weight each of the components of total cost with the same acreage used in the individual soil unit tables.

The difference between the computed costs used in the summary tables for a given yield and the unweighted costs (standard cost tables) is not expected to exceed 10% on any given component of total cost - spot checks of actual data have not exceeded five percent. Therefore, unless greater accuracy is desired than that provided by summary tables, it will not be necessary to weight detailed cost data for flood damage analysis purposes if standard detailed cost tables are used in determining such costs.

NET CROP PRODUCTION RETURNS

The analysis of crop production by soil units, upon which the summary tables are based, generally indicate the gross value of production to be greater than production costs. For the future conditions without the project, however, production costs of some crops on some of the soil units are higher than gross value of the crop. A correction has been made in the summary tables to remove the effect of these negative net returns where they occur. In making the correction, the actual returns for the negative net returns was assumed to be zero. In the long-run, shifts in land use may be expected that would largely avoid the losses incurred with the cropping system shown. By indicating a net income of zero for crops having a negative net return, the net error involved is negligible, and well within the limits of error in basic information used in project area analysis. Higher yields, as expected, show larger net returns to land than lower yields for the same enterprise. Inasmuch as the analysis assumes flood-free yields, consideration has not been given to the effect of flood damage on average annual net income.

LAND USE CONVERSIONS AND COSTS

Table VI shows the land use conversions that are anticipated with the project in place and the subsequent development of farm drainage systems. Clearing will be nearly complete in the lower project area, east and south of Crowleys Ridge,

but approximately 37% of the existing timber in the upper project area, west of Crowleys Ridge will remain in woods. Areas to be cleared will be converted to cropland uses.

Sixty-four percent of the woods areas in the A Zones of the three upper reaches of the project (Mingo, Main Stem No. 1 and Main Stem No. 2) will remain as woods and 47% of the woods in the B Zone will remain in woods. Considerable of this portion remaining in woods is due to the existence of small areas of farm woodlots and odd areas also the presence of hunting areas and gun clubs in the vicinity. The Mingo Wildlife Refuge occurs just above the northern project boundary area.

Table VI also contains the cost of making conversions (1955 level). Although conversions are taking place at a gradual rate due to several recent abnormally dry seasons, it is anticipated that the conversion will accelerate with the project installed and will be essentially completed in ten years.

Items of conversion costs include all expense of putting land from its present state into condition to produce a crop with only normal production costs remaining to be incurred. All capital costs of conversion have been amortized at 5% for a period of fifty years.

FARM DRAINAGE SYSTEM AND COSTS

Table VII contains estimates of amounts and costs of farm drainage systems that can be expected after satisfactory major outlets and connecting group drainage systems are developed. These estimates are based on the expectations that all open lands need drainage; that no drainage of any magnitude will be accomplished under future without project conditions, and than an estimated 25% west of Crowleys Ridge and from 0 to 10% east of Crowleys Ridge of total needs will not be drained because of lack of farmer participation. On better drained soils, a small drainage problem exists in the depression areas. Allowance has been made for this condition in crop yields and installation and maintenance costs.

Costs, computed at current levels, include the installation (construction, engineering and contingency) costs required for farm drainage systems for satisfactorily rapid removal of surface water accumulations that are likely to occur for the various conditions of rainfall and runoff involved. Requirements vary by soil mapping units and by land use. Costs include all ditching and appurtenant structural needs for systems to serve an average of one square mile. Estimates

are based on standard design data for conditions involved.

Farm drainage system capital costs have been amortized for useful life periods as reflected by different soil and maintenance conditions occurring in areas west of Crowleys Ridge and east of Crowleys Ridge.

Life of farm drainage systems west of Crowleys Ridge was estimated to be fifteen years for cropland and twenty years for pasture.

This life span was principally based on physical soil characteristics of the area together with recognition of the severe sediment deposition in the project area from adjacent Crowleys Ridge. Also, the agricultural development of most of the project area would indicate a lesser attention to maintenance of farm drains.

Life of farm drainage system east of Crowleys Ridge was estimated to be twenty years for cropland and thirty years for pasture. A longer life span for farm drainage systems has been estimated for areas east of Crowleys Ridge due to better soil conditions, a higher level of agricultural development and farm management. Sediment deposition from adjacent upland areas is minor as compared to west side.

All farm drainage has been amortized at five percent interest. Maintenance costs, varying with soil mapping units and land use, have been added to the amortized annual equivalent of installation cost to derive the annual cost of farm drainage systems.

GROUP DRAINAGE SYSTEMS AND COST

Group drainage proposed in the project consists of measures designed for the rehabilitation and extension of existing systems. No group drainage is needed on sub-areas: Ditch Nos. 19 and 36, Reach Nos. 2 and 1; Elk Chute; Treasure Island; and Ditch No. 81. The requirements for group drainage within these sub-areas will be served by the proposed rehabilitation and extension of major drainage ditches and the existing Little River System, due to their close proximity to farm drainage systems. All proposed group drainage system costs for areas east of Crowleys Ridge have been amortized for fifty years at 3½%.

The remaining group drainage system costs west of Crowleys Ridge have been amortized at thirty years at 3½%. Reasons for this thirty year estimated life in comparison with the area east of Crowleys Ridge is two-fold. (1) Systems are small and each

system is managed within itself with consequent lower standards of maintenance. (2) Deposition of damaging sediment from Crowleys Ridge.

Table VIII itemizes the costs (construction, engineering, and contingencies) required to install and maintain the group drainage ditches and appurtenant structures. Maintenance costs have been added to this amount to derive the total annual cost of group drainage systems.

NOTE: The word "Legal" as used before drainage and facilities in Tables VIII and IX, Sub-areas; Mingo, Main Stem #1, Main Stem #2, and Varney River, has the same meaning as the word "Group" as used above.

BENEFITS AND ASSOCIATED COSTS

Table IX summarizes net annual returns from Tables III and IV for Zones A and B, annual costs of making land conversions (from Table VI), and establishing and maintaining farm and group drainage systems (Tables VII and VIII).

Returns and gross benefit and all associated cost items have been discounted in column 3, Table IX, to account for estimated lag and build-up periods to full installation and maintenance requirements, and benefit accrual. The lag periods used as a basis for discounting benefits and associated costs are as follows:

1. Ten year lag in benefits and associated costs due to delay in installation and conversions.

Benefits and associated costs for sub-areas Mingo, Main Stem No. 1, Main Stem No. 2, Reach No. 3 of Ditch Nos. 19 and 36, and Varney River have been discounted as noted above for the following reason: past observations and experience in similar areas indicate that a ten year lag in build-up period to full installation and maintenance requirements and benefit accrual is applicable to these areas.

2. Instantaneous installation assumed with a five year lag in benefits.

Benefits and associated costs for Treasure Island, Elk Chute, and Reach Nos. 1 and 2 of Ditch Nos. 19 and 36 have been discounted as noted above for the following reasons: the prevalence of small and medium farm ownership with owners doing most of the work themselves will enable field drains and conversions to be made during the course of the rotation followed and will be performed within about three years due to the

fact that the field and farm laterals are already installed. It is assumed that maintenance of the field and farm laterals already installed, will continue whether the project is installed or not; hence there will be no creditable associated costs to the project.

3. Reasonably rapid installation with concurrent accrual of benefits.

This is anticipated in sub-area Ditch 81; hence benefits and associated costs have not been discounted to reflect a lag in build-up period to full installation and maintenance requirements and benefit accrual. The basis for this assumption is due to the physical characteristics of the area being a long strip approximately one-fourth mile wide adjacent to a very large ditch of the Little River System which renders the installation of farm drainage a simple and economical operation.

SUMMARY

The St. Francis River and Tributaries project area provides for stream alignment and improvement of the St. Francis River from Fisk to Crowleys Ridge and major drainage improvement of adjacent areas as well as drainage improvements in the Little River tributary to the St. Francis River.

The area east of Crowleys Ridge is highly developed agriculturally whereas the more poorly drained area; west of the Ridge, is less highly developed.

The study shows increased production from drainage benefits to be provided by the project. Some clearing will result, primarily in the northern part of the project area, but it is anticipated that the land use pattern will not be greatly changed. Yields will be materially increased, however, due to improved drainage conditions provided.

Yields for flood-free years have been used throughout this report. The Corps of Engineers, therefore, may need to modify the future without project values to account for flood damage. They may also need to modify future with project values to account for less than complete flood protection under project conditions.

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PROJECT - MINGO

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Mingo
State - Missouri

TABLE I

PRESENT LAND USE

Zone A

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
8	3,879	3,141	-	7,020
10	128	89	-	217
10S	315	79	-	394
15S	39	-	-	39
Subtotal - all soils	4,361	3,309	-	7,670
Water			-	-
Total - Zone A	4,361	3,309	-	7,670
Zone B				
8	145	1,466	-	1,611
Subtotal - all soils	145	1,466	-	1,611
Water			31	31
Total - Zone B	145	1,466	31	1,642
Project total - all soils	4,506	4,775	-	9,281
Water			31	31
GRAND TOTAL - Project	4,506	4,775	31	9,312

Basin - St. Francis River
and Tributaries
Project - Mingo
State - Missouri

SUMMARY TABLE II A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre 5/	Total
All	Open land	4,322			
	Crops	3,889			
	Corn	1,527	Bushel	19.7	30,140
	Soybeans	804	Bushel	15	12,060
	Sm.Grain (Wheat)2/	616	Bushel	15	9,240
	Hay & Pasture 3/	454	Lbs.Beef	100	45,400
	Perm. Pasture	209	Lbs.Beef	100	20,900
	Idle land	279			
	Other land 4/	433			
	Woodland	1,709			
	Total	6,031 6/			

1/ Parenthetical amounts are duplicated acreages.
2/ Several other small grains will be used, but all lumped together with wheat as base.
3/ This item considered cropland in rotation.
4/ Farmsteads, farm roads, waste and non-agricultural.
5/ Calculated from columns 3 and 6.
6/ Total reduced by 39 acres of soil not needing drainage.

Basin - St. Francis River and Tributaries
Project - Mingo
State - Missouri

SUMMARY - TABLE III A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	3,457		1/				2/		
	Crops	~~3,020~~ 3,112								
	Corn	1,221	Bushel	21.7	26,542	1.45	38,486	20.91	25,528	12,958
	Soybeans	645	Bushel	17	10,965	2.30	25,219	23.72	15,299	9,920
	Sm.Grain (Wheat)3/	492	Bushel	16	7,872	1.60	12,595	18.50	9,103	3,492
	Hay & Pasture 4/	363	Lbs.Beef	110	39,930	0.209	8,345	11.95	4,338	4,007
	Perm. Pasture	168	Lbs.Beef	110	18,480	0.209	3,862	10.03	1,685	2,177
	Idle land	223								
	Other land 5/	345								
	Woodland	1,208	Acres			6.54	7,901	3.83	4,627	3,274
	Total	4,665 6/					96,408		60,580	35,828

1/ Calculated from columns 3 and 6.
2/ Calculated from columns 3 and 10; rounded to nearest cent.
3/ Several other small grains will be used, but all lumped together with wheat as base.
4/ This item considered cropland in rotation.
5/ Farmsteads, farm roads, waste and non-agricultural.
6/ Total reduced by 865 acres not anticipated to receive drainage benefits from project.

Basin - St. Francis River and Tributaries
Project - Mingo
State - Missouri

SUMMARY TABLE IV A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITION WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per Acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	4,665		2/						
	Crops	4,199								
	Cotton	186	Lbs.	350	65,100	0.24	15,624	94.79	17,631	1,596
	Cotton seed	(186)	Ton		58.59	61.50	3,603			
	Corn	1,194	Bushel	39.7	47,460	1.45	68,817	31.60	37,732	31,085
	Soybeans	1,279	Bushel	22	28,138	2.30	64,718	27.70	35,429	29,289
	Sm.Grain (Wheat) 4/	720	Bushel	20	14,400	1.60	23,040	21.90	15,768	7,272
	Lespedeza 5/	(160)	Lbs.Beef	175	28,000	0.209	5,852	22.12	3,539	2,313
	Hay & Pasture 6/	373	Lbs.Beef	175	65,275	0.209	13,642	19.13	7,135	6,507
	Perm. Pasture	447	Lbs.Beef	175	78,225	0.209	16,349	17.21	7,693	8,656
	Other land 7/	466								
	Total	4,665					211,645		124,927	86,718

1/ Parenthetical amounts are duplicated acreages.
2/ Obtained from columns 3 and 6.
3/ Obtained from columns 3 and 10; rounded off to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation.
7/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Mingo
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Area	Production		
			Unit	Per acre	Total
				1/	
All	Open land	145			
(8)	Crops	130			
	Corn	65	Bushel	20	1,300
	Soybeans	65	Bushel	15	975
	Other land 2/	15			
	Woodland	1,110			
	Total	1,255			

1/ Calculated from columns 3 and 6.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 8.

Basin - St. Francis River and Tributaries
Project - Mingo
State - Missouri

SUMMARY TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURN: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All (8)	Open land	255		1/				2/		
	Crops	230								
	Corn	92	Bushel	22	2,024	1.45	2,935	21.02	1,934	1,001
	Soybeans	92	Bushel	17	1,564	2.30	3,597	23.72	2,182	1,415
	Sm.Grain(Wheat)3/	46	Bushel	16	736	1.60	1,178	18.50	851	327
	Other 4/	25								
	Woodland	800	Acres			8.47	6,776	5.06	4,048	2,728
	Total	1,055					14,486		9,015	5,471

1/ Calculated from columns 3 and 6.
2/ Calculated from columns 3 and 10; rounded to nearest cent.
3/ Several other small grains will be used, but all lumped together with wheat as base.
4/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is no. 8.

Basin - St. Francis River and Tributaries
Project - Mingo
State - Missouri

SUMMARY TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	1,055		2/				3/		
(8)	Crops	950								
	Corn	285	Bushel	38.2	10,887	1.45	15,786	30.49	8,690	7,096
	Soybeans	285	Bushel	21.5	6,128	2.30	14,094	27.38	7,804	6,290
	Sm.Grain(Wheat)4/	190	Bushel	19.6	3,724	1.60	5,958	21.16	4,020	1,938
	Hay & Pasture 5/	190	Lbs.Beef	168.5	32,015	0.209	6,691	18.41	3,498	3,193
	Other land 6/	105								
	Total	1,055					42,529		24,012	18,517

1/ Parenthetical amounts are duplicated acreages.
2/ Obtained from columns 3 and 6.
3/ Obtained from columns 3 and 10; rounded off to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This item considered cropland and in rotation.
6/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 8.

Basin - St. Francis River and Tributaries
Project - Mingo
State - Missouri

TABLE V
REACH SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production) Gross Value	Cost	Net Value	Future with project (Production) Gross Value	Cost	Net Value	Difference in net value
				ZONE A				
8	4,143	85,060	53,173	~~32,887~~ 31,887	185,904	109,980	75,924	~~43,037~~ 44,037
10	191	3,250	2,196	1,054	10,249	6,167	4,082	3,028
10S	331	8,098	5,211	2,887	15,492	8,780	6,712	3,825
Total	4,665	96,408	60,580	35,828	211,645	124,927	86,718	50,890
				ZONE B AND C				
8	1,055	14,486	9,015	5,471	42,529	24,012	18,517	13,046
Total	1,055	14,486	9,015	5,471	42,529	24,012	18,517	13,046
GRAND TOTAL:								
	5,720	110,894	69,595	41,299	254,174	148,939	105,235	63,936

NOTE: Total project area reduced by 3,592 acres which is total water area, and land not needing drainage, and non-participation in farm drainage in Zone A.

Basin - St. Francis River
and Tributaries
Project - Mingo
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/		50.00	10.00		60.00
GC to P (includes fencing)				38.40	38.40
Project					
W to GC	2,124	106,200	21,240		127,440
GC to P	279			10,714	10,714
Total project		106,200	21,240	10,714	138,154
Annual amortized value 2/					7,568
Annual maintenance (6.79 per acre)					1,894
Total annual cost of conversion					9,462

1/ W - woodland; GC - general dry-farmed crops; P - pasture.
2/ Amortized at 5% for 50 years.

Basin - St. Francis River and Tributaries
Project - Mingo
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

	Soil mapping unit and land use	Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
8	General crops	3,356	31,150	3,001	3,594	6,595
8	Permanent pasture	373	2,721	218	105	323
	Total	3,729 3/	33,871	3,219	3,699	6,918
10	General crops	172	1,705	164	197	361
10	Permanent pasture	-				
	Total	172 3/	1,705	164	197	361
10S	General crops	224	1,963	189	227	416
10S	Permanent pasture	74	394	32	15	47
	Total	298 3/	2,357	221	242	463
GRAND TOTAL		5,054 3/	37,933	3,604	4,138	7,742

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 15 years, and for pasture over 20 years. Maintenance cost are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste, and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Mingo
State - Missouri

TABLE VIII
ANALYSIS OF LEGAL DRAINAGE NEEDS AND COSTS

Item	Unit	Amount	Unit cost	Total cost
			Dollars	Dollars
Excavation	Cu. Yds.	60,500	0.13	7,865
Spreading spoil	Cu. Yds.	60,500	0.02	1,210
Clearing right-of-way	Acres	102	40.00	4,080
Right-of-way easements	-			
Crossings	No.	2	300.00	600
Swinging water gaps	-			
Grade control structure	-			
Flap gates	-			
Vegetative plantings	-			
Total construction cost				13,755
Engineering cost				1,376
Contingencies and legal cost				1,376
Total installation cost				16,507
Annual equivalent - installation cost (Amortized for 50 years at 3½ percent)				704
Annual maintenance cost (5 percent of cost)				688
Total annual cost of required legal facilities				1,392

Basin - St. Francis River
and Tributaries
Project - Mingo
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	105,235	-
2. Net return without project	41,299	-
3. Gross benefit to project	63,936	50,685
4. Farm drainage cost		
a. Installation cost	3,604	-
b. Maintenance cost	4,138	-
c. Total	7,742	6,137
5. Group drainage cost		
a. Installation cost	704	-
b. Maintenance cost	688	-
c. Total	1,392	1,156
6. Conversion cost		
a. Installation cost	7,568	-
b. Maintenance cost	1,894	-
c. Total	9,462	7,501
TOTAL ASSOCIATED COSTS		14,794

NOTE: Discounted amounts in column 3 reflect an estimated 10 year lag to full installation, maintenance, and benefit accrual.

PROJECT - MAIN STEM

REACH 1

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - No. 1
State - Missouri

TABLE I

PRESENT LAND USE

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
Zone A				
8	7,099	9,768	-	16,867
10	13,115	7,503	-	20,618
10S	128	1,704	-	1,832
Subtotal - all soils	20,342	18,975	-	39,317
Water			-	-
Total - Zone A	20,342	18,975	-	39,317
Zone B				
8	5,596	8,563	-	14,159
10	1,526	1,576	-	3,102
Subtotal - all soils	7,122	10,139	-	17,261
Water			175	175
Total - Zone B	7,122	10,139	175	17,436
Zone C				
8	506	7,362	-	7,868
10	20	49	-	69
Subtotal - all soils	526	7,411	-	7,937
Water			100	100
Total - Zone C	526	7,411	100	8,037
Project total - all soils	27,990	36,525	-	64,515
Water			275	275
GRAND TOTAL - Project	27,990	36,525	275	64,790

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - No. 1
State - Missouri

SUMMARY TABLE II A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre 2/	Total
All	Open land	20,342			
	Crops	18,308			
	Cotton	708	Lbs.	200	141,600
	Cotton seed	(708)	Ton		127.44
	Corn	4,101	Bushel	18.5	76,118
	Soybeans	6,250	Bushel	15	93,750
	Sm.Grain (Wheat)3/	3,470	Bushel	15	52,050
	Lespedeza 4/	(1,820)	Lbs.Beef	100	182,000
	Hay & Pasture 5/	1,465	Lbs.Beef	100	146,500
	Perm. Pasture	1,085	Lbs.Beef	100	108,500
	Idle land	1,229			
	Other land 6/	2,034			
	Woodland	14,231			
	Total	34,573			

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Several other small grains will be used, but all lumped together with wheat as base.
4/ This lespedeza acreage was over-seeded in wheat.
5/ This item considered cropland in rotation.
6/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - No. 1
State - Missouri

SUMMARY - TABLE III A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	16,324								
	Crops	14,692		2/				3/		
	Cotton	554	Lbs.	220.0	121,880	0.24	29,251	69.16	38,315	- 2,318
	Cotton seed	(554)	Ton		109.69	61.50	6,746			
	Corn	3,259	Bushel	20.5	67,082	1.45	97,269	20.41	66,519	30,750
	Soybeans	4,990	Bushel	17.0	84,830	2.30	195,109	23.72	118,363	76,746
	Sm. Grain (Wheat) 4/	2,818	Bushel	16.0	45,088	1.60	72,141	18.50	52,134	20,007
	Lespedeza 5/	(1,452)	Lbs. Beef	110.0	159,720	0.209	33,382	15.12	21,954	11,428
	Hay & Pasture 6/	1,175	Lbs. Beef	110.0	129,250	0.209	27,014	11.95	14,042	12,972
	Perm. Pasture	905	Lbs. Beef	110.0	99,550	0.209	20,805	10.03	9,078	11,727
	Idle land	991								
	Other land 7/	1,632								
	Woodland	6,322	Acres			7.68	48,553	4.74	29,966	18,586
	Total	22,586					530,270		350,372	179,898 8/ 182,216 9/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation.
7/ Farmsteads, farm roads, waste and non-agricultural
8/ Includes negative net returns on soil unit 10.
9/ Adjusted to eliminate negative net returns.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

SUMMARY TABLE IV A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per Acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	22,646		2/						
	Crops	20,382								
	Cotton	1,572	Lbs.	335.1	526,800	0.24	126,432	91.79	144,301	11,289
	Cotton seed	(1,572)	Ton		474.12	61.50	29,158			
	Corn	4,913	Bushel	37.6	184,824	1.45	267,995	30.08	147,801	120,194
	Soybeans	5,913	Bushel	22	130,086	2.30	299,198	27.70	163,790	135,408
	Sm. Grain(Wheat) 4/	4,273	Bushel	20	85,826	1.60	137,322	21.98	93,921	43,401
	Lespedeza 5/	(2,382)	Lbs.Beef	175	416,850	0.209	87,122	22.12	52,690	34,432
	Hay & Pasture 6/	1,797	Lbs.Beef	175	314,475	0.209	65,725	19.13	34,376	31,349
	Perm. Pasture	1,914	Lbs.Beef	175	334,950	0.209	70,004	17.21	32,940	37,064
	Other land 7/	2,264								
	Total	22,646					1,082,956		669,819	413,137

1/ Parenthetical amounts are duplicated acreages.
2/ Obtained from columns 3 and 6.
3/ Obtained from columns 3 and 10; rounded off to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation.
7/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre 2/	Total
All	Open land	7,122			
	Crops	6,409			
	Cotton	806	Lbs.	200	161,200
	Cotton seed	(806)	Ton		145.08
	Corn	1,424	Bushel	19.55	27,848
	Soybeans	1,841	Bushel	15	27,615
	Sm.Grain (Wheat)3/	1,309	Bushel	15	19,635
	Lespedeza 4/	(654)	Lbs.Beef	100	65,400
	Hay & Pasture 5/	137	Lbs.Beef	100	13,700
	Idle land	892			
	Other land 6/	713			
	Woodland	8,111			
	Total	15,233			

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Several other small grains will be used, but all lumped together, with wheat as base.
4/ This lespedeza acreage was over-seeded in wheat.
5/ This item considered cropland in rotation (Permanent pasture negligible).
6/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

SUMMARY TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	8,744		2/						
	Crops	7,869								
	Cotton	1,003	Lbs.	219.9	220,660	0.24	52,958	69.16	69,367	-4,196
	Cotton seed	(1,003)	Ton		198.59	61.50	12,213			
	Corn	1,747	Bushel	21.6	37,698	1.45	54,662	20.84	36,406	18,256
	Soybeans	2,253	Bushel	17.0	38,301	2.30	88,092	23.72	53,441	34,651
	Sm.Grain(Wheat) 4/	1,606	Bushel	16.0	25,696	1.60	41,114	18.50	29,711	11,403
	Lespedeza 5/	(803)	Lbs.Beef	110.0	88,330	0.209	18,461	15.12	12,141	6,320
	Hay & Pasture 6/	160	Lbs.Beef	110.0	17,600	0.209	3,678	10.03	1,605	2,073
	Idle land	1,100								
	Other land 7/	875								
	Woodland	5,191				8.11	42,099	4.48	23,255	18,844
	Total	13,935					313,277		225,926	87,351 8/ 91,547 9/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation (Permanent pasture negligible).
7/ Farmsteads, farm roads, waste and non-agricultural.
8/ Includes negative net returns.
9/ Adjusted to eliminate negative net returns.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

SUMMARY TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	13,935		2/						
	Crops	12,542								
	Cotton	1,207	Lbs.	310.4	374,640	0.24	89,913	86.83	104,798	5,851
	Cotton seed	(1,207)	Ton		337.18	61.50	20,736			
	Corn	3,136	Bushel	34.9	109,291	1.45	158,472	28.11	88,158	70,314
	Soybeans	3,136	Bushel	20.8	65,229	2.30	150,027	26.93	84,452	65,575
	Sm.Grain(Wheat) 4/	2,556	Bushel	19.0	48,564	1.60	77,703	21.06	53,830	23,873
	Lespedeza 5/	(1,255)	Lbs.Beef	158.8	199,294	0.209	41,652	20.35	25,541	16,111
	Hay & Pasture 6/	1,254	Lbs.Beef	158.8	199,135	0.209	41,619	17.53	21,977	19,642
	Perm. Pasture	1,253	Lbs.Beef	158.8	198,977	0.209	41,586	15.42	19,321	22,265
	Other land 7/	1,393								
	Total	13,935					621,708		398,077	223,631

1/ Parenthetical amounts are duplicated acreages.
2/ Obtained from columns 3 and 6.
3/ Obtained from columns 3 and 10; rounded off to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation.
7/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

SUMMARY TABLE II C
(Zone of No Project Benefit)
COMPUTATION OF AGRICULTURAL PRODUCTION: EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres	Production		
			Unit	Per acre	Total
All	Open land	526			
	Crops	90			
	Corn	45	Bushel	15	675
	Soybeans	45	Bushel	12	540
	Idle land	383			
	Other land 1/	53			
	Woodland	7,411			
	Total	7,937			

1/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

SUMMARY TABLE III C
(Zone of No Project Benefit)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	526								
	Crops	0								
	Idle land	473								
	Other land 1/	53								
	Woodland	7,411	Acres			10.43	77,297	5.58	41,353	35,944
	Total	7,937					77,297		41,353	35,944

1/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

TABLE V
REACH SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production) Gross Value	Cost	Net Value	Future with project (Production) Gross Value	Cost	Net Value	Difference in net value
				ZONE A				
8	8,840	185,625	116,420	69,205	425,087	263,455	161,632	92,427
10	12,993	335,674	228,544	109,448 1/	622,088	386,247	235,841	126,393
10S	813	8,971	5,408	3,563	35,781	20,117	15,664	12,101
Total	22,646	530,270	350,372	182,216	1,082,956	669,819	413,137	230,921
				ZONES B AND C				
8	19,218	334,214	231,911	106,499 1/	588,500	369,202	219,298	112,799
10	2,654	56,360	35,368	20,992	110,505	70,228	40,277	19,285
Total	21,872	390,574	267,279	127,491	699,005	439,430	259,575	132,084
GRAND TOTAL	44,518 2/	920,844	617,651	309,707	1,781,961	1,109,249	672,712	363,005

1/ Adjusted to eliminate negative returns.
2/ Total project area reduced by 6,419 acres which is total water area, and land not needing drainage, and non-participation in farm drainage in Zone A.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/		50.00	10.00		60.00
GC to P (includes fencing)				38.40	38.40
Project					
W to GC	12,216	610,800	122,160		732,960
GC to P	2,262			86,861	86,861
Total project		610,800	122,160	86,861	819,821
Annual amortized value 2/					44,910
Annual maintenance (6.51 per acre)					14,726
Total annual cost of conversion					59,636

1/ W - woodland; GC - general dry-farmed crops; P - pasture.
2/ Amortized at 5% for 50 years.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

Soil mapping unit and land use		Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
8	General crops	14,057	130,476	12,570	15,055	27,625
8	Permanent pasture	1,561	11,384	913	438	1,351
	Total	15,618 3/	141,860	13,483	15,493	28,976
10	General crops	12,328	122,282	11,781	14,109	25,890
10	Permanent pasture	1,111	7,380	592	284	876
	Total	13,439 3/	129,662	12,373	14,393	26,766
10S	General crops	549	4,810	463	555	1,018
10S	Permanent pasture	183	973	78	37	115
	Total	732 3/	5,783	541	592	1,133
GRAND TOTAL		29,789 3/	277,305	26,397	30,478	56,875

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 15 years, and for pasture over 20 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

TABLE VIII
ANALYSIS OF LEGAL DRAINAGE NEEDS AND COSTS

Item	Unit	Amount	Unit cost	Total cost
			Dollars	Dollars
Excavation	Cu. Yds.	132,840	0.13	17,269
Spreading spoil	Cu. Yds.	132,840	0.02	2,657
Clearing right-of-way	Acres	252	40.00	1,008
Right-of-way easements	Acres	-	-	
Crossings	No.	4	300.00	1,200
Swinging water gaps	No.	-	-	
Grade control structures	No.	-		
Flap gates	No.	-		
Vegetative plantings	Acres	-		
Total construction cost				22,134
Engineering cost				2,213
Contingencies and legal cost				2,213
Total installation cost				26,560
Annual equivalent - installation cost (Amortized for 30 years at 3½ percent)				1,444
Annual maintenance cost 1/				13,280
Total annual cost of required legal facilities				14,724

1/ Maintenance was calculated at 5% of original construction cost, plus present proposed enlargement.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 1
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	672,814	-
2. Net return without project	309,707	-
3. Gross benefit to project	363,107	287,853
4. Farm drainage cost		
a. Installation cost	26,597	-
b. Maintenance cost	30,478	-
c. Total	56,875	45,088
5. Legal drainage cost		
a. Installation cost	1,444	-
b. Maintenance cost	13,280	-
c. Total	14,724	12,226
6. Conversion cost		
a. Installation cost	44,910	-
b. Maintenance cost	14,726	-
c. Total	59,636	47,276
TOTAL ASSOCIATED COSTS		104,590

NOTE: Discounted amounts in column 3 reflect an estimated 10 year lag to full installation, maintenance and benefit accrual.

PROJECT - MAIN STEM

REACH 2

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - No. 2
State - Missouri

TABLE I

PRESENT LAND USE

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
Zone A				
8	4,431	3,082	-	7,513
10	11,077	2,658	-	13,735
15S	325	-	-	325
Subtotal - all soils	15,833	5,740	-	21,573
Water			-	-
Total - Zone A	15,833	5,740	-	21,573
Zone B				
8	5,102	10,952	-	16,054
10	1,092	728	-	1,820
Subtotal - all soils	6,194	11,680	-	17,874
Water			369	369
Total - Zone B	6,194	11,680	369	18,243
Project total - all soils	22,027	17,420	-	39,447
Water			369	369
GRAND TOTAL - Project	22,027	17,420	369	39,816

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - No. 2
State - Missouri

SUMMARY TABLE II A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre 2/	Total
All	Open land	15,508			
	Crops	13,957			
	Cotton	1,396	Lbs.	200	279,200
	Cotton seed	(1,396)	Ton		251.28
	Corn	3,928	Bushel	18.6	73,176
	Soybeans	3,210	Bushel	15	48,150
	Sm.Grain (Wheat)3/	2,791	Bushel	15	41,865
	Hay & Pasture 5/	598	Lbs.Beef	100	59,800
	Lespedeza 4/	(798)	Lbs.Beef	100	79,800
	Perm. Pasture	997	Lbs.Beef	100	99,700
	Idle land	1,037			
	Other land 6/	1,551			
	Woodland	4,305			
	Total	19,813			

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Several other small grains will be used, but all lumped together with wheat as base.
4/ This lespedeza acreage was over-seeded in wheat.
5/ This item considered cropland in rotation.
6/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

SUMMARY - TABLE III A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	11,954		2/				3/		
	Crops	10,758								
	Cotton	1,076	Lbs.	205.8	221,500	0.24	53,160	68.20	73,384	- 7,964
	Cotton seed	(1,076)	Ton		199.35	61.50	12,260			
	Corn	3,031	Bushel	19.2	58,462	1.45	84,770	20.24	61,353	23,417
	Soybeans	2,484	Bushel	17.0	42,228	2.30	97,125	24.00	59,616	37,509
	Sm.Grain (Wheat) 4/	2,147	Bushel	16.0	34,352	1.60	54,963	18.05	38,754	16,209
	Lespedeza 5/	(609)	Lbs.Beef	110.0	66,990	0.209	14,001	14.02	8,536	5,465
	Hay & Pasture 6/	457	Lbs.Beef	110.0	50,270	0.209	10,506	13.02	5,950	4,556
	Perm. Pasture	766	Lbs.Beef	110.0	84,260	0.209	17,610	11.10	8,503	9,107
	Idle land	797								
	Other land 7/	1,196								
	Woodland	1,905	Acres			9.86	18,783	5.41	10,306	8,477
	Total	13,859					363,178		266,402	96,776 8/ 104,740 9/

1/ Parenthetical amounts are duplicated acreages.
2/ Obtained from columns 3 and 6.
3/ Obtained from columns 3 and 10; rounded off to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item cropland in rotation.
7/ Farmsteads, farm roads, waste and non-agricultural.
8/ Includes negative net returns on Soil Units 8 and 10.
9/ Adjusted to eliminate negative net returns.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

SUMMARY TABLE IV A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per Acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	13,859		2/						
	Crops	12,474								
	Cotton	1,247	Lbs.	333.0	415,250	0.24	99,660	92.93	115,880	6,764
	Cotton seed	(1,247)	Ton		373.73	61.50	22,984			
	Corn	3,373	Bushel	37.2	125,420	1.45	181,859	29.64	99,978	81,881
	Soybeans	3,119	Bushel	22.0	68,618	2.30	157,822	27.92	87,082	70,740
	Sm.Grain (Wheat) 4/	2,495	Bushel	20.0	49,900	1.60	79,840	21.22	52,944	26,896
	Lespedeza 5/	(2,495)	Lbs.Beef	175.0	436,625	0.209	91,255	23.39	58,358	32,897
	Hay & Pasture 6/	993	Lbs.Beef	175.0	173,775	0.209	36,319	20.77	20,624	15,695
	Perm. Pasture	1,247	Lbs.Beef	175.0	218,225	0.209	45,609	18.85	23,506	22,103
	Other land 7/	1,385								
	Total	13,859					715,348		458,372	256,976

1/ Parenthetical amounts are duplicated acreages.
2/ Obtained from columns 3 and 6.
3/ Obtained from columns 3 and 10; rounded off to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation.
7/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre 2/	Total
All	Open land	6,194			
	Crops	5,575			
	Cotton	524	Lbs.	200	104,800
	Cotton seed	(524)	Ton		94.32
	Corn	1,588	Bushel	19.67	31,248
	Soybeans	1,813	Bushel	15	27,195
	Sm. Grain(Wheat)3/	577	Bushel	15	8,655
	Lespedeza 4/	(577)	Lbs.Beef	100	57,700
	Hay & Pasture 5/	748	Lbs.Beef	100	74,800
	Idle land	325			
	Other land 6/	619			
	Woodland	9,344			
	Total	15,538			

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Several other small grains will be used, but all lumped together with wheat as base.
4/ This lespedeza acreage was over-seeded in wheat.
5/ This item considered cropland in rotation (Permanent pasture negligible).
6/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

SUMMARY TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	8,062		2/				3/		
	Crops	7,256								
	Cotton	668	Lbs.	214.8	143,480	0.24	34,435	69.18	46,212	-3,836
	Cotton seed	(668)	Ton		129.13	61.50	7,941			
	Corn	2,072	Bushel	21.5	44,452	1.45	64,455	21.10	43,725	20,730
	Soybeans	2,354	Bushel	17.0	40,018	2.30	92,041	24.00	56,496	35,545
	Sm.Grain(Wheat)4/	747	Bushel	16.0	11,952	1.60	19,123	18.05	13,484	5,639
	Lespedeza 5/	(747)	Lbs.Beef	110.0	82,170	0.209	17,174	16.18	12,086	5,088
	Hay & Pasture 6/	990	Lbs.Beef	110.0	108,900	0.209	22,760	13.02	12,890	9,870
	Idle land	425								
	Other land 7/	806								
	Woodland	5,981	Acres			12.26	73,327	6.02	36,005	37,322
	Total	14,043					331,256		220,898	110,358 8/
										114,194 9/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation (Permanent pasture negligible).
7/ Farmsteads, farm roads, waste and non-agricultural.
8/ Includes negative net returns.
9/ Adjusted to eliminate negative net returns.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

SUMMARY TABLE IV B
(Zone for Drainage and Floor Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	14,043		2/				3/		
	Crops	12,639								
	Cotton	1,264	Lbs.	314.83	397,955	0.24	98,296	89.09	112,605	7,718
	Cotton seed	(1,264)	Ton		358.16	61.50	22,027			
	Corn	3,160	Bushel	35.04	110,756	1.45	160,596	28.18	89,064	71,532
	Soybeans	3,231	Bushel	20.80	67,205	2.30	154,572	27.15	87,722	66,850
	Sm.Grain(Wheat)4/	2,528	Bushel	19.0	48,032	1.60	76,851	20.43	51,647	25,204
	Lespedeza 5/	(1,517)	Lbs.Beef	158.8	240,900	0.209	50,348	21.60	32,768	17,580
	Hay & Pasture 6/	1,193	Lbs.Beef	158.8	189,449	0.209	39,594	18.84	22,476	17,118
	Perm. Pasture	1,263	Lbs.Beef	158.8	200,565	0.209	41,918	16.92	21,370	20,548
	Other land 7/	1,404								
	Total	14,043					644,202		417,652	226,550

1/ Parenthetical amounts are duplicated acreages.
2/ Obtained from columns 3 and 6.
3/ Obtained from columns 3 and 10; rounded off to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation.
7/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

TABLE V
REACH SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production) Gross Value	Cost	Net Value	Future with project (Production) Gross Value	Cost	Net Value	Difference in net value
				ZONE A				
8	4,434	117,119	83,023	35,599 1/	233,538	149,278	84,260	48,661
10	9,425	246,059	183,379	69,141 1/	481,810	309,094	172,716	103,575
Total	13,859	363,178	266,402	104,740	715,348	458,372	256,976	152,236
				ZONE B				
8	12,462	~~286,405~~ 286,350	186,898	101,811 1/	570,996	371,650	199,346	97,535
10	1,581	44,906	34,000	12,383 1/	73,206	46,002	27,204	14,821
Total	14,043	~~331,311~~ 331,256	220,898	114,194	644,202	417,652	226,550	112,356
GRAND TOTAL								
	27,902 2/	~~694,489~~ 694,434	487,300	218,934	1,359,550	876,024	483,526	264,592

1/ Adjusted to eliminate negative net returns.
2/ Total project area reduced by 4,890 acres which is total water area, and land not needing drainage, and non-participation in farm drainage in Zone A.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/		50.00	10.00		60.00
GC to P (including fencing)				38.40	38.40
Project					
W to GC	8,098	404,900	80,980		485,880
GC to P	1,402			53,837	53,837
Total project		404,900	80,980	53,837	539,717
Annual amortized value 2/					29,566
Annual maintenance (6.33 per acre)					8,875
Total annual cost of conversion					38,441

1/ W - woodland; GC - general dry-farmed crops; P - pasture.
2/ Amortized at 5% for 50 years.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

	Soil mapping unit and land use	Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
8	General crops	11,163	103,615	9,982	11,956	21,938
8	Permanent pasture	1,240	9,043	726	348	1,074
	Total	12,403 3/	112,658	10,708	12,304	23,012
10	General crops	8,595	85,254	8,213	9,837	18,050
10	Permanent pasture	955	6,344	509	244	753
	Total	9,550 3/	91,598	8,722	10,081	18,803
GRAND TOTAL		21,953 3/	204,256	19,430	22,385	41,815

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 15 years, and for pasture over 20 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

TABLE VIII
ANALYSIS OF LEGAL DRAINAGE NEEDS AND COSTS

Item	Unit	Amount	Unit cost	Total cost
			Dollars	Dollars
Excavation	Cu. Yds.	171,400	0.13	22,282
Spreading spoil	Cu. Yds.	171,400	0.02	3,428
Clearing right-of-way	Acres	88	40.00	3,520
Right-of-way easements	Acres	30	100.00	3,000
Crossings	No.	6	300.00	1,800
Swinging water gaps	No.	-		
Grade control structures	No.	-		
Flap gates	No.	-		
Vegetative plantings	No.	-		
Total construction cost				34,030
Engineering cost				3,403
Contingencies and legal cost				3,403
Total installation cost				40,836
Annual equivalent - installation cost (Amortized for 30 years at 3½ percent)				2,220
Annual maintenance cost 1/				4,880
Total annual cost of required legal facilities				7,100

1/ Maintenance was calculated at 5% of original construction cost plus present proposed enlargement.

Basin - St. Francis River
and Tributaries
Project - Main Stem
Reach - 2
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	483,526	-
2. Net return without project	218,934	-
3. Gross benefit to project	264,592	209,755
4. Farm drainage cost		
a. Installation cost	19,430	-
b. Maintenance cost	22,385	-
c. Total	41,815	33,149
5. Legal drainage cost		
a. Installation cost	2,220	-
b. Maintenance cost	4,880	-
c. Total	7,100	5,895
6. Conversion cost		
a. Installation cost	29,566	-
b. Maintenance cost	8,875	-
c. Total	38,441	30,474
TOTAL ASSOCIATED COSTS		69,518

NOTE: Discounted amounts in column 3 reflect an estimated 10 year lag to full installation, maintenance and benefit accrual.

PROJECT - LITTLE RIVER

SUB-AREA - DITCH NOS. 19 and 36

REACH 3

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

TABLE I
PRESENT LAND USE

Zone A

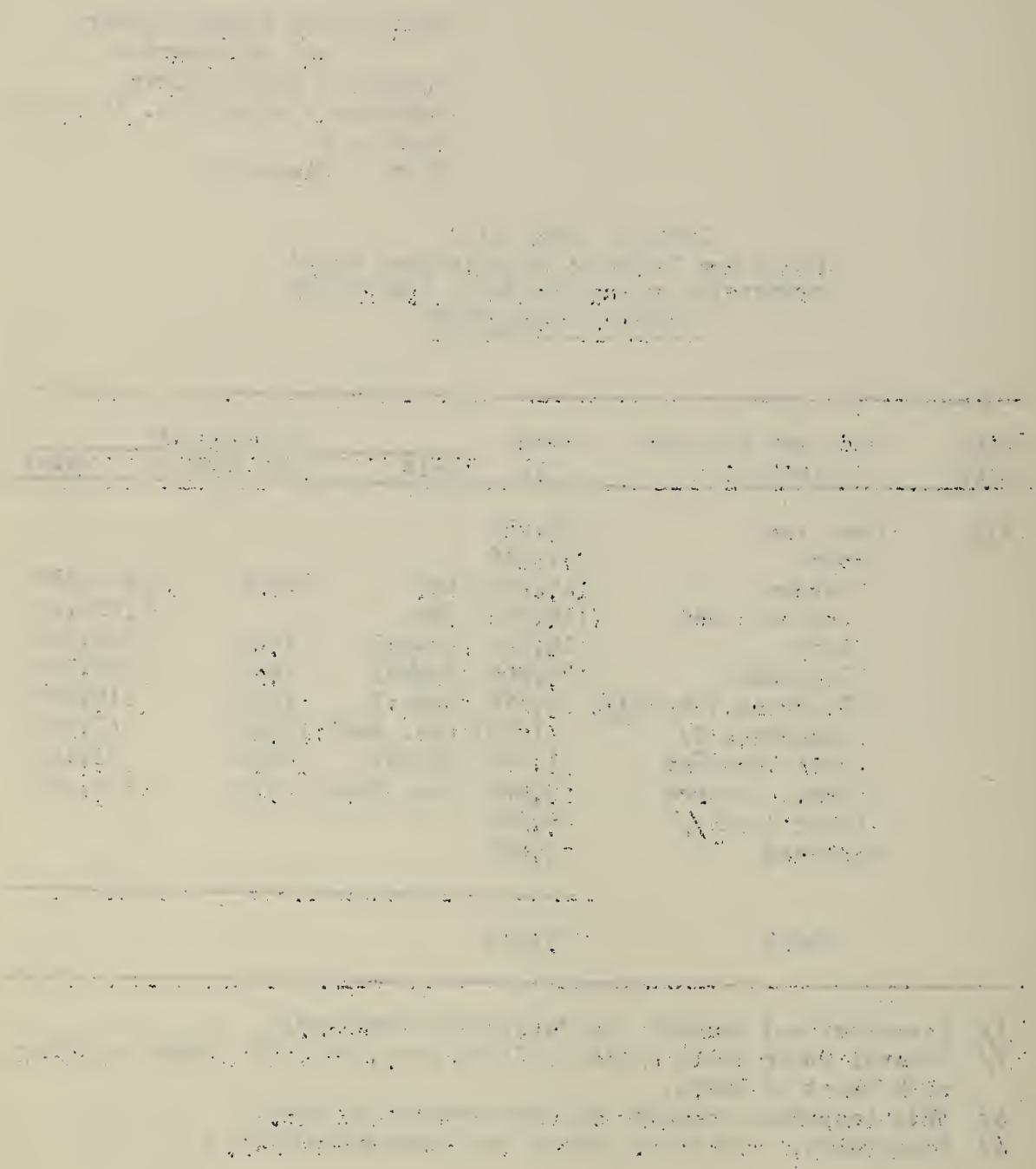
Soil mapping unit	Open	Wooded	Water	Urban	Total
	(Acres)	(Acres)	(Acres)	(Acres)	(Acres)
3	13,559	551	-	-	14,110
6	2,836	108	-	-	2,944
8	7,049	1,388	-	-	8,437
10	4,815	207	-	-	5,022
12U and 12SU	31,320	580	-	-	31,900
16	8,694	729	-	-	9,423
Subtotal - all soils	68,273	3,563	-	-	71,836
(Urban)			-	925	925
Total - Zone A	68,273	3,563	-	925	72,761
Zone B					
3	3,143	22	-	-	3,165
8	80	-	-	-	80
12SU	513	22	-	-	535
16	50	-	-	-	50
Subtotal - all soils	3,786	44	-	-	3,830
Water			232	-	232
Total - Zone B	3,786	44	232	-	4,062
Project total - all soils	72,059	3,607	-	-	75,666
Water			232	-	232
Urban			-	925	925
GRAND TOTAL - Project	72,059	3,607	232	925	76,823

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

SUMMARY TABLE II A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production Unit	Per acre	Total
All	Open land	68,273			
	Crops	61,446			
	Cotton	16,362	Lbs.	222.5	3,640,450
	Cotton seed	(16,362)	Ton		3,276.41
	Corn	15,644	Bushel	18.9	295,746
	Soybeans	16,809	Bushel	14.2	239,145
	Sm.Grain (Wheat)2/	8,526	Bushel	13.5	115,203
	Lespedeza 3/	(470)	Lbs. Beef	100.0	47,000
	Grain Sorghum	1,409	Bushel	15.0	21,135
	Perm. Pasture	2,696	Lbs. Beef	88.4	238,200
	Other land 4/	6,827			
	Woodland	3,563			
	Total	71,836			

1/ Parenthetical amounts are duplicated acreages.
2/ Several other small grains will be used, but all lumped together with wheat as base.
3/ This lespedeza acreage was over-seeded in wheat.
4/ Farmsteads, farm roads, waste and non-agricultural.



Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre	Total
All	Open land	3,786			
	Crops	3,408			
	Cotton	1,643	Lbs.	246.5	405,000
	Cotton seed	(1,643)	Ton		364.50
	Corn	754	Bushel	23.2	17,475
	Soybeans	895	Bushel	18.3	16,380
	Sm.Grain (Wheat)2/	116	Bushel	12.0	1,392
	Other land 3/	378			
	Woodland	44			
	Total	3,830			

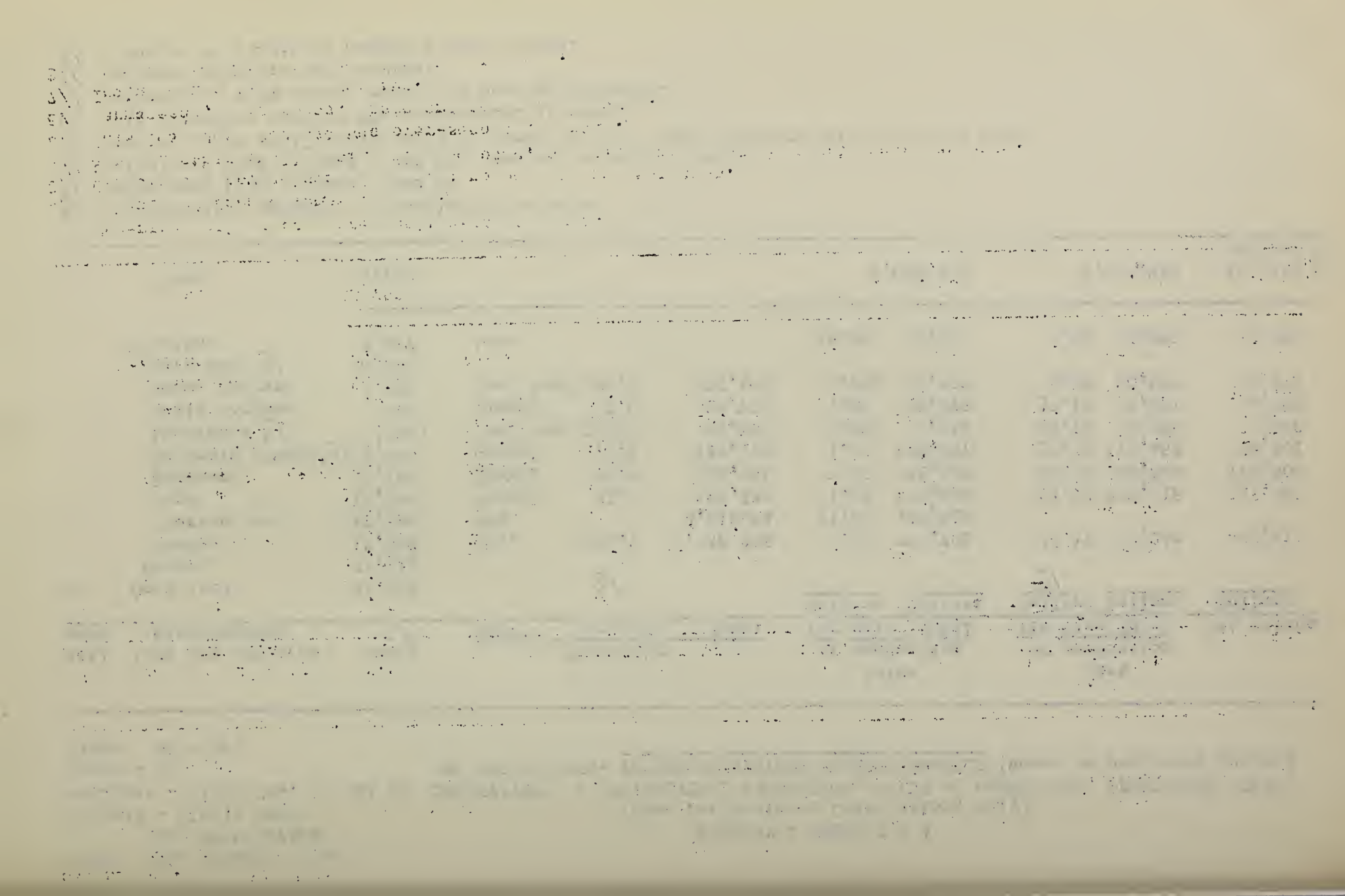
1/ Parenthetical amounts are duplicated acreages.
2/ Several other small grains will be used, but all lumped together with wheat as base.
3/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

SUMMARY - TABLE III A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	53,125		2/						
	Crops	47,813								
	Cotton	12,856	Lbs.	251.7	3,236,275	0.24	776,705	76.17	979,243	-23,411
	Cotton seed	(12,856)	Ton		2,912.64	61.50	179,127			
	Corn	12,206	Bushel	21.4	261,722	1.45	379,496	21.13	257,915	121,581
	Soybeans	13,188	Bushel	15.6	205,434	2.30	472,499	22.72	299,694	172,805
	Sm.Grain (Wheat)4/	6,543	Bushel	18.7	122,179	1.60	153,297	17.34	113,456	39,841
	Lespedeza 5/	(376)	Lbs. Beef	110.0	41,360	0.209	8,644	16.18	6,084	2,560
	Grain Sorghum	987	Bushel	17.0	16,779	1.53	25,672	17.13	16,907	8,765
	Perm. Pasture	2,033	Lbs. Beef	100.0	202,405	0.209	42,302	9.85	20,027	22,275
	Other land 6/	5,312								
	Woodland	2,667	Acres			15.36	40,964	8.65	23,070	17,894
	Total	55,792					2,078,706		1,716,396	362,310 7/ 395,947 8/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ Farmsteads, farm roads, waste and non-agricultural.
7/ Includes negative net returns.
8/ Adjusted to eliminate negative net returns.



Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

SUMMARY - TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	3,786		2/				3/		
	Crops	3,408								
	Cotton	1,643	Lbs.	285.1	468,420	0.24	112,421	82.93	136,251	2,097
	Cotton seed	(1,643)	Ton		421.58	61.50	25,927			
	Corn	754	Bushel	25.2	18,983	1.45	27,526	22.67	17,093	10,433
	Soybeans	895	Bushel	20.0	17,866	2.30	41,092	26.27	23,510	17,582
	Sm.Grain (Wheat)4/	116	Bushel	13.0	1,508	1.60	2,413	16.48	1,912	501
	Other land 5/	378								
	Woodland	44	Acres			15.36	676	8.65	380	296
	Total	3,830					210,055		179,146	30,909 6/ 31,458 7/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ Farmsteads, farm roads, waste and non-agricultural.
6/ Includes negative net returns from Soil Units 12U and 12SU.
7/ Adjusted to eliminate negative net returns.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

SUMMARY - TABLE IV A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	55,792		2/						
	Crops	50,213								
	Cotton	13,520	Lbs.	345.6	4,673,125	0.24	1,121,550	95.88	1,296,296	83,913
	Cotton seed	(13,520)	Ton		4,205.83	61.50	258,659			
	Corn	11,247	Bushel	35.6	400,038	1.45	580,056	29.68	333,761	246,295
	Soybeans	12,375	Bushel	20.6	254,578	2.30	585,530	26.32	325,726	259,804
	Sm.Grain (Wheat) 4/	8,445	Bushel	17.6	148,790	1.60	238,064	19.36	163,518	74,546
	Lespedeza 5/	(8,445)	Lbs.Beef	140.3	1,185,200	0.209	247,707	19.55	165,061	82,646
	Perm.Pasture	4,626	Lbs.Beef	127.4	589,325	0.209	123,168	13.18	60,953	62,215
	Other land 6/	5,579								
	Total	55,792					3,154,734		2,345,315	809,419 7/ 817,927 8/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ Farmsteads, farm roads, waste and non-agricultural.
7/ Includes negative net returns from Soil Units 12U and 12SU.
8/ Adjusted to eliminate net returns.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

SUMMARY - TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	3,830		2/				3/		
	Crops	3,448								
	Cotton	1,545	Lbs.	419.2	647,730	0.24	155,455	111.71	172,590	18,718
	Cotton seed	(1,545)	Ton		582.96	61.50	35,853			
	Corn	878	Bushel	43.3	38,028	1.45	55,141	34.39	30,191	24,950
	Soybeans	905	Bushel	26.0	23,541	2.30	54,144	30.20	27,329	26,815
	Sm.Grain(Wheat) 4/	120	Bushel	14.6	1,752	1.60	2,803	17.20	2,064	739
	Lespedeza 5/	(120)	Lbs.Beef	97.0	11,640	0.209	2,433	14.59	1,751	682
	Other land 6/	382								
	Total	3,830					305,829		233,925	71,904 7/ 72,170 8/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ Farmsteads, farm roads, waste and non-agricultural.
7/ Includes negative net returns from Soil Unit 12SU.
8/ Adjusted to eliminate negative net returns.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

TABLE V
REACH SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production) Gross Value	Cost	Net Value	Future with project (Production) Gross Value	Cost	Net Value	Difference in net value
				ZONE A				
3	12,754	623,301	487,605	135,696	1,058,325	752,477	305,848	170,152
6	2,660	137,820	100,652	37,168	200,366	135,544	64,822	27,654
8	6,472	226,779	184,122	49,439 1/	388,474	275,226	113,248	63,809
10	4,019	134,680	105,837	32,152 1/	224,913	156,216	68,697	36,545
12U&SU	22,342	666,761	606,258	84,049 1/	823,924	695,363	137,069 1/	53,020
16	7,545	289,365	231,922	57,443	458,732	330,489	128,243	70,800
Total	55,792	2,078,706	1,716,396	395,947 1/	3,154,734	2,345,315	817,927 1/	421,980
				ZONE B				
3	3,165	190,243	162,070	28,173	279,722	213,195	66,527	38,354
8	80	2,650	1,666	984	3,544	1,986	1,558	574
12SU	535	15,726	14,451	1,824 1/	20,070	17,379	2,957 1/	1,133
16	50	1,436	959	477	2,493	1,365	1,128	651
Total	3,830	210,055	179,146	31,458 1/	305,829	233,925	72,170 1/	40,712
GRAND TOTAL	59,622 2/	2,288,761	1,895,542	427,405 1/	3,460,563	2,579,240	890,097 1/	462,692

1/ Adjusted to eliminate negative returns in Soil units 8, 10, 12U, and 12SU.
2/ Total project area reduced by 16,702 acres which is total water and urban areas, and land not needing drainage, and non-participation in farm drainage in Zone A.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/		55.00	15.00		70.00
GC to P (includes fencing)				38.40	38.40
Project					
W to GC	3,108	170,940	46,620		217,560
GC to P	1,930			74,112	74,112
Total project		170,940	46,620	74,112	291,672
Annual amortized value 2/					15,978
Annual maintenance (5.35 per acre)					10,326
Total annual cost of conversion					26,304

1/ W-woodland; GC - general dry-farmed crops; P-pasture.
2/ Amortized at 5% for 50 years.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

	Soil mapping unit and land use	Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
3	General crops	14,043	80,691	6,475	9,311	15,786
3	Permanent pasture	-	-	-	-	-
	Total	14,043 3/	80,691	6,475	9,311	15,786
6	General crops	2,155	12,383	994	1,429	2,423
6	Permanent pasture	239	1,062	69	41	110
	Total	2,394 3/	13,445	1,063	1,470	2,533
8	General crops	5,424	50,345	4,040	5,809	9,849
8	Permanent pasture	466	3,398	221	131	352
	Total	5,890 3/	53,743	4,261	5,940	10,201
10	General crops	3,255	30,763	2,468	3,550	6,018
10	Permanent pasture	362	2,405	156	93	249
	Total	3,617 3/	33,168	2,624	3,643	6,267
12SU & 12U	General crops	17,477	18,858	1,513	3,627	5,140
12SU & 12U	Permanent pasture	3,016	-	-	-	-
	Total	20,493 3/	18,858	1,513	3,627	5,140
16	General crops	6,287	45,687	3,666	7,029	10,695
16	Permanent pasture	543	2,182	142	84	226
	Total	6,830 3/	47,869	3,808	7,113	10,921
GRAND TOTAL		53,267 3/	247,774	19,744	31,104	50,848

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 20 years, and for pasture over 30 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

TABLE VIII
ANALYSIS OF GROUP DRAINAGE NEEDS AND COSTS

Item	Unit	Amount	Unit cost	Total cost
			Dollars	Dollars
Excavation	Cu. Yds.	85,000	0.13	11,050
Spreading spoil	Cu. Yds.	170,000	0.02	3,400
Clearing right-of-way	Acres	242.5	40.00	9,700
Right-of-way easements	Acres	24	100.00	2,400
Crossings	No.	1	1,200.00	1,200
Swinging water gaps	No.	-	-	-
Grade control structures	No.	-	-	-
Flap gates	No.	-	-	-
Vegetative plantings	Acres	-	-	-
Total construction cost				27,750
Engineering cost				2,775
Contingencies and legal cost				2,775
Total installation cost				33,300
Annual equivalent - installation cost (Amortized for 50 years at 3½ percent)				1,420
Annual maintenance cost 1/				1,388
Total annual cost of required group facilities				2,808

1/ Maintenance was calculated at 5% of original construction cost, plus present proposed enlargement.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 3
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	890,097	-
2. Net return without project	427,405	-
3. Gross benefit to project	462,692	366,776 1/
4. Farm drainage cost		
a. Installation cost	19,744	-
b. Maintenance cost	31,104	-
c. Total	51,218	40,600 1/
5. Group drainage cost		
a. Installation cost	1,420	—
b. Maintenance cost	1,388	—
c. Total	2,808	2,332 2/
6. Conversion cost		
a. Installation cost	14,455	—
b. Maintenance cost	10,326	—
c. Total	24,781	19,644 1/
TOTAL ASSOCIATED COSTS		62,576

1/ Discounted amounts reflect an estimated ten year lag @ 5% (0.79270) to full installation, maintenance and benefit accrual.
2/ Discounted amount reflects an estimated ten year lag @ 3½% (0.83040) to full installation and maintenance.

PROJECT - LITTLE RIVER

SUB-AREA - DITCH NOS. 19 and 36

REACH 2

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

TABLE I
PRESENT LAND USE

Zone A

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
3	4,381	40	-	4,421
12SU	906	98	-	1,004
Subtotal - all soils	5,287	138	-	5,425
Water			-	-
Total - Zone A	5,287	138	-	5,425

Zone B

3	4,668	118	-	4,786
Subtotal - all soils	4,668	118	-	4,786
Water			162	162
Total - Zone B	4,668	118	162	4,948
Project total - all soils	9,955	256	-	10,211
Water			162	162
GRAND TOTAL - Project	9,955	256	162	10,373

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

SUMMARY TABLE II A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre	Total
All	Open land	5,287			
	Crops	4,758			
	Cotton	1,862	Lbs.	242.3	451,250
	Cotton seed	(1,862)	Ton		406.13
	Corn	462	Bushel	21.8	10,080
	Soybeans	2,271	Bushel	19.0	43,220
	Sm. Grain (Wheat) 2/	41	Bushel	12.0	492
	Perm. Pasture	122	Lbs. Beef	75.0	9,150
	Other land 3/	529			
	Woodland	138			
	Total	5,425			

1/ Parenthetical amounts are duplicated acreages.
2/ Several other small grains will be used, but all lumped together with wheat as base.
3/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre	Total
All	Open land	4,668			
(3)	Crops	4,201			
	Cotton	1,680	Lbs.	250	420,000
	Cotton seed	(1,680)	Ton		378.00
	Corn	210	Bushel	25	5,250
	Soybeans	2,311	Bushel	20	46,220
	Other land 2/	467			
	Woodland	118			
	Total	4,786			

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

SUMMARY - TABLE III A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	4,577		2/						
	Crops	4,120								
	Cotton	1,620	Lbs.	281.4	455,800	0.24	109,392	82.17	133,116	1,504
	Cotton seed	(1,620)	Ton		410.22	61.50	25,228			
	Corn	386	Bushel	24.4	9,402	1.45	13,633	22.34	8,623	5,010
	Soybeans	1,999	Bushel	21.1	42,130	2.30	96,899	27.17	54,307	42,592
	Sm. Grain (Wheat) 4/	29	Bushel	13.0	377	1.60	603	16.48	478	125
	Perm. Pasture	86	Lbs. Beef	85.0	7,310	0.209	1,528	8.11	697	831
	Other land 5/	457								
	Woodland	138	Acres			15.36	2,119	8.65	1,194	925
	Total	4,715					249,402		198,415	50,987 6/ 51,942 7/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ Farmsteads, farm roads, waste and non-agricultural.
6/ Includes negative net returns.
7/ Adjusted to eliminate negative net returns.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

SUMMARY - TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	4,668								
(3)	Crops	4,201								
	Cotton	1,680	Lbs.	290.0	487,200	0.24	116,928	83.92	140,986	2,909
	Cotton seed	(1,680)	Ton		438.48	61.50	26,967			
	Corn	210	Bushel	27.0	5,670	1.45	8,222	23.42	4,918	3,304
	Soybeans	2,311	Bushel	22.0	50,842	2.30	116,937	27.92	64,523	52,414
	Other land 2/	467								
	Woodland	118	Acres			15.36	1,812	8.65	1,021	791
	Total	4,786					270,866		211,448	59,418

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

SUMMARY - TABLE IV A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	4,715		2/				3/		
	Crops	4,244								
	Cotton	1,453	Lbs.	422.7	614,250	0.24	147,420	69.70	163,484	17,935
	Cotton seed	(1,453)	Ton		552.83	61.50	33,999			
	Corn	849	Bushel	45.3	38,490	1.45	55,811	36.19	30,722	25,089
	Soybeans	1,712	Bushel	28.8	49,380	2.30	113,574	32.16	55,058	58,516
	Sm.Grain (Wheat)4/	98	Bushel	15.0	1,470	1.60	2,352	17.32	1,697	655
	Hay & Pasture 9/	66	Lbs. Beef	100.0	6,600	0.209	1,379	11.41	753	626
	Lespedeza 5/	(98)	Lbs. Beef	100.0	9,800	0.209	2,048	15.07	1,477	571
	Perm. Pasture	66	Lbs. Beef	100.0	6,600	0.209	1,379	9.91	654	725
	Other land 6/	471								
	Total	4,715					357,962		253,845	104,117 7/
										104,452 8/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ Farmsteads, farm roads, waste and non-agricultural.
7/ Includes negative net returns from Soil Unit 12SU.
8/ Adjusted to eliminate negative net returns.
9/ This item considered cropland in rotation.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

SUMMARY - TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	4,786								
(3)	Crops	4,308								
	Cotton	1,508	Lbs.	450.0	678,600	0.24	162,864	118.35	178,472	21,953
	Cotton seed	(1,508)	Ton		610.74	61.50	37,561			
	Corn	862	Bushel	50.0	43,100	1.45	62,495	39.07	33,678	28,817
	Soybeans	1,938	Bushel	30.0	58,140	2.30	133,722	33.02	63,993	69,729
	Other land 2/	478								
	Total	4,786					396,642		276,143	120,499

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

TABLE V
REACH SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production) Gross Value	Cost	Net Value	Future with project (Production) Gross Value	Cost	Net Value	Difference in net value
				ZONE A				
3	3,983	226,715	177,675	49,040	330,079	229,803	100,276	51,236
12SU	732	22,687	20,740	2,902 1/	27,883	24,042	4,176 1/	1,274
Total	4,715	249,402	198,415	51,942 1/	357,962	253,845	104,452 1/	52,510
				ZONE B				
3	4,786	270,866	211,448	59,418	396,642	276,143	120,499	61,081
GRAND TOTAL	9,501 2/	520,268	409,863	111,360 1/	754,604	529,988	224,951	113,591

1/ Adjusted to eliminate negative returns.
2/ Total project area reduced by 872 acres which is total water area, and land not needing drainage, and non-participation in farm drainage in Zone A.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/ GC to P (includes fencing)		55.00	15.00		70.00
Project					
W to GC GC to P	256	14,080	3,840		17,920
Total Project		14,080	3,840		17,920
Annual amortized value 2/					982
Annual maintenance					—
Total annual cost of conversion					982

1/ W - woodland; GC - general dry-farmed crops; P - pasture
2/ Amortized at 5% for 50 years.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

	Soil mapping unit and land use	Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
3	General crops	7,893	45,353	3,639	5,233	8,872
3	Permanent pasture	-	-	-	-	-
	Total	7,893 3/	45,353	3,639	5,233	8,872
12SU	General crops	593	639	51	123	174
12SU	Permanent pasture	66	-	-	-	-
	Total	659 3/	639	51	123	174
GRAND TOTAL		8,552 3/	45,992	3,690	5,356	9,046

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 20 years, and for pasture over 30 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 2
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	224,951	-
2. Net return without project	111,360	-
3. Gross benefit to project	113,591	102,290 1/
4. Farm drainage cost		
a. Installation cost	3,690	-
b. Maintenance cost	5,356	-
c. Total	9,046	9,046 2/
5. Conversion cost		
a. Installation cost	982	-
b. Maintenance cost	-	-
c. Total	982	982 2/
TOTAL ASSOCIATED COSTS		10,028

1/ Discounted amount reflects an estimated five year lag @ 5% (0.90051) to full benefit accrual.
2/ Instantaneous installation assumed.

PROJECT - VARNEY RIVER

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Varney River
State - Missouri

TABLE I

PRESENT LAND USE

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
Zone A				
3U	2,284	10	-	2,294
8U	5,907	177	-	6,084
9U	16,945	128	-	17,073
Subtotal - all soils	25,136	315	-	25,451
Water			-	-
Total - Zone A	25,136	315	-	25,451
Zone B				
3U	1,262	34	-	1,296
8U	368	114	-	482
9U	503	10	-	513
Subtotal - all soils	2,133	158	-	2,291
Water			45	45
Total - Zone B	2,133	158	45	2,336
Project total - all soils	27,269	473	-	27,742
Water			45	45
GRAND TOTAL - Project	27,269	473	45	27,787

Basin - St. Francis River
and Tributaries
Project - Varney River
State - Missouri

SUMMARY TABLE II A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre 2/	Total
All	Open land	20,898			
	Crops	18,808			
	Cotton	6,622	Lbs.	336.4	2,227,400
	Cotton seed	(6,622)	Ton		2,004.66
	Corn	4,740	Bushel	27.5	130,440
	Soybeans	4,398	Bushel	16.0	70,495
	Sm.Grain (Wheat)3/	1,944	Bushel	18.0	34,992
	Melons	1,104	Each	275.9	304,600
	Other land 4/	2,090			
	Woodland	315			
	Total	21,213			

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Several other small grains will be used, but all lumped together with wheat as base.
4/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Varney River
State - Missouri

SUMMARY TABLE III A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	17,130		2/						
	Crops	15,417								
	Cotton	5,535	Lbs.	361.6	2,001,490	0.24	480,358	99.15	548,787	42,354
	Cotton seed	(5,535)	Ton		1,801.34	61.50	110,783			
	Corn	3,776	Bushel	29.5	111,375	1.45	163,277	25.16	94,988	68,289
	Soybeans	3,741	Bushel	17.5	65,286	2.30	150,158	24.20	90,546	59,612
	Sm.Grain(Wheat)4/	1,458	Bushel	20.0	29,160	1.60	46,656	21.45	31,274	15,382
	Melons	907	Each	298.6	270,875	0.27	73,137	71.69	65,025	8,112
	Other land 5/	1,713								
	Woodland	315	Acres			9.86	3,106	5.41	1,704	1,402
	Total	17,445					1,027,475		832,324	195,151 6/ 204,578 7/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ Farmsteads, farm roads, waste and non-agricultural.
6/ Includes negative net returns on soil unit 8U.
7/ Adjusted to eliminate negative net returns.

Basin - St. Francis River and Tributaries
Project - Varney River
State - Missouri

SUMMARY TABLE IV A
(Zone for Drainage Calculations Only)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per Acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	17,445		2/						
	Crops	15,701								
	Cotton	3,553	Lbs.	461.6	1,673,750	0.24	401,700	122.18	434,120	60,223
	Cotton seed	(3,553)	Ton		1,506.38	61.50	92,643			
	Corn	3,141	Bushel	44.1	138,465	1.45	200,775	34.38	107,984	92,791
	Soybeans	3,554	Bushel	22.9	81,318	2.30	187,031	28.41	100,974	86,057
	Sm.Grain (Wheat) 4/	1,858	Bushel	20.9	38,898	1.60	62,237	22.29	41,410	20,827
	Lespedeza 5/	(1,858)	Lbs.Beef	175	325,150	0.209	67,956	22.97	42,678	25,278
	Hay & Pasture 6/	1,363	Lbs.Beef	175	238,525	0.209	49,852	20.23	27,574	22,278
	Perm.Pasture	928	Lbs.Beef	175	162,400	0.209	33,942	18.31	16,992	16,950
	Melons	869	Each	350	304,150	0.27	82,121	80.33	69,807	12,314
	Grain Sorghum	435	Bushel	30	13,050	1.53	19,967	24.72	10,753	9,214
	Other 7/	1,744								
	Total	17,445					1,198,224		852,292	345,932

1/ Parenthetical amounts are duplicated acreages.
2/ Obtained from columns 3 and 6.
3/ Obtained from columns 3 and 10; rounded off to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation.
7/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Varney River
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre 2/	Total
All	Open land	2,133			
	Crops	1,920			
	Cotton	703	Lbs.	280.7	197,300
	Cotton seed	(703)	Ton		177.57
	Corn	416	Bushel	25.3	10,535
	Soybeans	710	Bushel	18.6	13,205
	Sm. Grain(Wheat)3/	91	Bushel	18.0	1,638
	Other 4/	213			
	Woodland	158			
	Total	2,291			

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Several other small grains will be used, but all lumped together with wheat as base.
4/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Varney River
State - Missouri

SUMMARY TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	2,133		2/						
	Crops	1,920								
	Cotton	703	Lbs.	319.4	224,520	0.24	53,884	89.94	63,227	3,084
	Cotton seed	(703)	Ton		202.06	61.50	12,427			
	Corn	416	Bushel	27.6	11,503	1.45	16,680	23.92	9,952	6,728
	Soybeans	711	Bushel	20.3	14,442	2.30	33,217	26.50	18,839	14,378
	Sm.Grain(Wheat)4/	90	Bushel	20	1,800	1.60	2,880	21.45	1,931	949
	Other land 5/	213								
	Woodland	158				12.26	1,937	6.02	951	986
	Total	2,291					121,025		94,900	26,125 6/ 26,643 7/

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ Farmsteads, farm roads, waste and non-agricultural.
6/ Includes negative net returns on soil unit 8U.
7/ Adjusted to eliminate negative net returns.

Basin - St. Francis River and Tributaries
Project - Varney River
State - Missouri

SUMMARY TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars 3/	Dollars	Dollars
All	Open land	2,291		2/						
	Crops	2,062								
	Cotton	645	Lbs.	447.5	288,699	0.24	69,288	117.06	75,501	9,767
	Cotton seed	(645)	Ton		259.83	61.50	15,980			
	Corn	414	Bushel	45.8	18,985	1.45	27,528	36.05	14,924	12,604
	Soybeans	689	Bushel	26.9	18,548	2.30	42,661	30.96	21,336	21,325
	Sm.Grain(Wheat) 4/	133	Bushel	20.3	2,699	1.60	4,318	21.73	2,890	1,428
	Lespedeza 5/	(133)	Lbs.Beef	177.0	23,538	0.209	4,920	23.19	3,084	1,836
	Hay & Pasture 6/	89	Lbs.Beef	181.2	16,124	0.209	3,370	19.03	1,694	1,676
	Melons	46	Each	345.0	15,870	0.27	4,285	79.48	3,656	629
	Grain Sorghum	46	Bushel	29.0	1,334	1.53	2,041	24.12	1,110	931
	Other land 7/	229								
	Total	2,291					174,391		124,195	50,196

1/ Parenthetical amounts are duplicated acreages.
2/ Calculated from columns 3 and 6.
3/ Calculated from columns 3 and 10; rounded to nearest cent.
4/ Several other small grains will be used, but all lumped together with wheat as base.
5/ This lespedeza acreage was over-seeded in wheat.
6/ This item considered cropland in rotation (Permanent pasture negligible).
7/ Farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River and Tributaries
Project - Varney River
State - Missouri

TABLE V
REACH SUMMARY BY SOIL MAPPING UNIT

Soil unit	Acres	Future without project (Production) Gross Value	Cost	Net Value	Future with project (Production) Gross Value	Cost	Net Value	Difference in net value
				ZONE A				
3U	2,294	133,038	106,593	26,445	196,719	140,507	56,212	29,767
8U	5,493	248,969	226,489	31,907 1/	313,598	216,681	96,917	65,010
9U	9,658	645,468	499,242	146,226	687,907	495,104	192,803	46,577
Total	17,445	1,027,475	832,324	204,578	1,198,224	852,292	345,932	141,354
				ZONE B				
3U	1,296	71,854	56,350	15,504	111,054	79,308	31,746	16,242
8U	482	16,228	13,370	3,376 1/	27,183	18,856	8,327	4,951
9U	513	32,943	25,180	7,763	36,154	26,031	10,123	2,360
Total	2,291	121,025	94,900	26,643	174,391	124,195	50,196	23,553
GRAND TOTAL	19,736 2/	1,148,500	927,224	231,221	1,372,615	976,487	396,128	164,907

1/ Adjusted to eliminate negative returns.
2/ Total project area reduced by 8,006 acres which is total water area, and land not needing drainage, and non-participation in farm drainage in Zone A.

Basin - St. Francis River
and Tributaries
Project - Varney River
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/		50.00	10.00		60.00
GC to P (includes fencing)				38.40	38.40
Project					
W to GC	473	23,650	4,730		28,380
GC to P	928			35,635	35,635
Total project		23,650	4,730	35,635	64,015
Annual amortized value 2/					3,507
Annual maintenance (6.79 per acre)					6,301
Total annual cost of conversion					9,808

1/ W - woodland; GC - general dry-farmed crops; P - pasture.
2/ Amortized at 5% for 50 years.

Basin - St. Francis River
and Tributaries
Project - Varney River
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

Soil mapping unit and land use		Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
3U	General crops	3,231	24,698	2,379	2,850	5,229
3U	Permanent pasture	-				
	Total	3,231 3/	24,698	2,379	2,850	5,229
8U	General crops	4,841	37,005	3,565	4,270	7,835
8U	Permanent pasture	494	2,171	174	84	258
	Total	5,335 3/	39,176	3,739	4,354	8,093
9U	General crops	8,627	23,327	2,247	2,692	4,939
9U	Permanent pasture	434	1,174	90	27	117
	Total	9,061 3/	24,501	2,337	2,719	5,056
GRAND TOTAL		17,627 3/	88,375	8,455	9,923	18,378

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 20 years, and for pasture over 30 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Varney River
State - Missouri

TABLE VIII
ANALYSIS OF LEGAL DRAINAGE NEEDS AND COSTS

Item	Unit	Amount	Unit cost	Total cost
			Dollars	Dollars
Excavation	Cu. Yds.	30,000	0.13	3,900
Spreading spoil	Cu. Yds	30,000	0.02	780
Clearing right-of-way	Acres	103	40.00	4,120
Right-of-way easements	Acres	-		
Crossings	No.	-		
Swinging water gaps	No.	-		
Grade control structures	No.	-		
Flap gates	No.	-		
Vegetative plantings	No.	-		
Total construction cost				8,800
Engineering cost				880
Contingencies and legal cost				880
Total installation cost				10,560
Annual equivalent - installation cost (Amortized for 30 years at 3½ percent)				574
Annual maintenance cost 1/				7,571
Total annual cost of required legal facilities				8,145

1/ Maintenance was calculated at 5% of original construction cost plus present proposed enlargement.

Basin - St. Francis River
and Tributaries
Project - Varney River
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	396,128	-
2. Net return without project	231,221	-
3. Gross benefit to project	164,907	130,730
4. Farm drainage cost		
a. Installation cost	8,455	-
b. Maintenance cost	9,923	-
c. Total	18,378	14,569
5. Legal drainage cost		
a. Installation cost	574	-
b. Maintenance cost	7,571	-
c. Total	8,145	6,763
6. Conversion cost		
a. Installation cost	3,507	-
b. Maintenance cost	6,301	-
c. Total	9,808	7,775
TOTAL ASSOCIATED COSTS		29,107

NOTE: Discounted amounts in column 3 reflect an estimated 10 year lag to full installation, maintenance, and benefit accrual.

PROJECT - LITTLE RIVER

SUB-AREA - DITCH NOS. 19 and 36

REACH 1

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 1
State - Missouri

TABLE I
PRESENT LAND USE

Zone B

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
3	2,004	106	-	2,110
Project total - all soils	2,004	106	-	2,110
Water			69	69
GRAND TOTAL - Project	2,004	106	69	2,179

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 1
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre	Total
All	Open land	2,004			
(3)	Crops	1,804			
	Cotton	613	Lbs.	250	153,250
	Cotton seed	(613)	Ton		137.93
	Soybeans	1,191	Bushel	20	23,820
	Other land 2/	200			
	Woodland	106			
	Total	2,110			

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 1
State - Missouri

SUMMARY - TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	2,004								
(3)	Crops	1,804								
	Cotton	613	Lbs.	290.0	177,770	0.24	42,665	83.92	51,443	1,061
	Cotton seed	(613)	Ton		159.99	61.50	9,839			
	Soybeans	1,191	Bushel	22.0	26,202	2.30	60,265	27.92	33,253	27,012
	Other land 2/	200								
	Woodland	106	Acres			15.36	1,628	8.65	917	711
	Total	2,110					114,397		85,613	28,784

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 1
State - Missouri

SUMMARY - TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	2,110								
(3)	Crops	1,899								
	Cotton	665	Lbs.	450	299,250	0.24	71,820	118.35	78,703	9,681
	Cotton seed	(665)	Ton		269.33	61.50	16,564			
	Corn	380	Bushel	50	19,000	1.45	27,550	39.07	14,847	12,703
	Soybeans	854	Bushel	30	25,620	2.30	58,926	33.02	28,199	30,727
	Other land 2/	211								
	Total	2,110					174,860		121,749	53,111

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 1
State - Missouri

TABLE V
REACH SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production)			Future with project (Production)			Difference in net value
		Gross Value	Cost	Net Value	Gross Value	Cost	Net Value	
				ZONE A				
				NONE				
				ZONE B				
3	2,110	114,397	85,613	28,784	174,860	121,749	53,111	24,327
GRAND TOTAL	2,110	114,397	85,613	28,784	174,860	121,749	53,111	24,327

NOTE: Total project area reduced by 69 acres which is total water area.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 1
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/ GC to P (includes fencing)		60.00	20.00		80.00
Project					
W to GC GC to P	106	6,360	2,120		8,480
Total project		6,360	2,120		8,480
Annual amortized value 2/					465
Annual maintenance					-
Total annual cost of conversion					465

1/ W - woodland; GC - general dry-farmed crops; P - pasture.
2/ Amortized at 5% for 50 years.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 1
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

	Soil mapping unit and land use	Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
3	General crops	1,899	11,549	927	1,339	2,266
	Permanent pasture	-	-	-	-	-
	Total	1,899 3/	11,549	927	1,339	2,266
GRAND TOTAL		1,899 3/	11,549	927	1,339	2,266

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 20 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch Nos. 19 and 36
Reach - 1
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	53,111	-
2. Net return without project	28,784	-
3. Gross benefit to project	24,327	21,907 1/
4. Farm drainage cost		
a. Installation cost	927	-
b. Maintenance cost	1,339	-
c. Total	2,266	2,266 2/
5. Conversion cost		
a. Installation cost	465	-
b. Maintenance cost	-	-
c. Total	465	465 2/
TOTAL ASSOCIATED COSTS	2,731	2,731

1/ Discounted amount reflects an estimated five year lag @ 5% (0.90051) to full benefit accrual.
2/ Instantaneous installation assumed.

PROJECT - LITTLE RIVER

SUB-AREA - ELK CHUTE

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Elk Chute
State - Missouri

TABLE I
PRESENT LAND USE

Zone B

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
3	2,778	149	-	2,927
Project Total - all soils	2,778	149	-	2,927
Water			18	18
GRAND TOTAL - Project	2,778	149	18	2,945

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Elk Chute
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre	Total
All	Open land	2,778			
(3)	Crops	2,500			
	Cotton	850	Lbs.	250	212,500
	Cotton seed	(850)	Ton		191.25
	Corn	125	Bushel	25	3,125
	Soybeans	1,525	Bushel	20	30,500
	Other land 2/	278			
	Woodland	149			
	Total	2,927			

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Elk Chute
State - Missouri

SUMMARY - TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	2,778								
(3)	Crops	2,500								
	Cotton	850	Lbs.	290.0	246,500	0.24	59,160	83.92	71,332	1,472
	Cotton seed	(850)	Ton		221.85	61.50	13,644			
	Corn	125	Bushel	27.0	3,375	1.45	4,894	23.42	2,928	1,966
	Soybeans	1,525	Bushel	22.0	33,550	2.30	77,165	27.92	42,578	34,587
	Other land 2/	278								
	Woodland	149	Acres			8.50	1,267	4.07	606	661
	Total	2,927					156,130		117,444	38,686

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Elk Chute
State - Missouri

SUMMARY - TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	2,927								
(3)	Crops	2,634								
	Cotton	922	Lbs.	450	414,900	0.24	99,576	118.35	109,119	13,422
	Cotton seed	(922)	Ton		373.41	61.50	22,965			
	Corn	527	Bushel	50	26,350	1.45	38,208	39.07	20,590	17,618
	Soybeans	1,185	Bushel	30	35,550	2.30	81,765	33.02	39,129	42,636
	Other land 2/	293								
	Total	2,927					242,514		168,838	73,676

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Elk Chute
State - Missouri

TABLE V
SUB-AREA SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production)			Future with project (Production)			Difference in net value
		Gross Value	Cost	Net Value	Gross Value	Cost	Net Value	
				ZONE A				
				NONE				
				ZONE B				
3	2,927	156,130	117,444	38,686	242,514	168,838	73,676	34,990
GRAND TOTAL	2,927	156,130	117,444	38,686	242,514	168,838	73,676	34,990

NOTE: Total project area reduced by 18 acres which is total water area.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Elk Chute
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/ GC to P (includes fencing)		60.00	20.00		80.00
Project					
W to GC GC to P	149	8,940	2,980		11,920
Total project		8,940	2,980		11,920
Annual amortized value 2/					653
Annual maintenance					-
Total annual cost of conversion					653

1/ W - woodland; GC - general dry-farmed crops; P - pasture.
2/ Amortized at 5% for 50 years.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Elk Chute
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

	Soil mapping unit and land use	Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
3	General crops	2,634	16,094	1,291	1,857	3,148
	Permanent pasture	-	-	-	-	-
	Total	2,634 3/	16,094	1,291	1,857	3,148
GRAND TOTAL		2,634 3/	16,094	1,291	1,857	3,148

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 20 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Elk Chute
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	73,676	-
2. Net return without project	38,686	-
3. Gross benefit to project	34,990	31,509 1/
4. Farm drainage cost		
a. Installation cost	1,291	-
b. Maintenance cost	1,857	-
c. Total	3,148	3,148 2/
5. Conversion cost		
a. Installation cost	653	-
b. Maintenance cost	-	-
c. Total	653	653 2/
TOTAL ASSOCIATED COSTS	3,801	3,801

1/ Discounted amount reflects an estimated 5 year lag @ 5% (0.90051) to full benefit accrual.
2/ Instantaneous installation assumed.

PROJECT - LITTLE RIVER

SUB-AREA - TREASURE ISLAND

St. Francis River And Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Treasure Island
State - Missouri

TABLE I
PRESENT LAND USE

Zone B

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
3	5,194	561	-	5,755
Project total - all soils	5,194	561	-	5,755
Water			48	48
GRAND TOTAL - Project	5,194	561	48	5,803

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Treasure Island
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre	Total
All	Open land	5,194			
(3)	Crops	4,675			
	Cotton	1,543	Lbs.	250	385,750
	Cotton seed	(1,543)	Ton		347.2
	Soybeans	3,132	Bushel	20	62,640
	Other land 2/	519			
	Woodland	561			
	Total	5,755			

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Treasure Island
State - Missouri

SUMMARY - TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	5,194								
(3)	Crops	4,675								
	Cotton	1,543	Lbs.	290.0	447,470	0.24	107,393	83.92	129,489	2,671
	Cotton seed	(1,543)	Ton		402.72	61.50	24,767			
	Soybeans	3,132	Bushel	22.0	68,904	2.30	158,479	27.92	87,445	71,034
	Other land 2/	519								
	Woodland	561	Acres			8.50	4,769	4.07	2,283	2,486
	Total	5,755					295,408		219,217	76,191

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Treasure Island
State - Missouri

SUMMARY - TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	5,755								
(3)	Crops	5,180								
	Cotton	1,813	Lbs.	450	815,850	0.24	195,804	118.35	214,569	26,393
	Cotton seed	(1,813)	Ton		734.27	61.50	45,158			
	Corn	1,036	Bushel	50	51,800	1.45	75,110	39.07	40,477	34,633
	Soybeans	2,331	Bushel	30	69,930	2.30	160,839	33.02	76,970	83,869
	Other land 2/	575								
	Total	5,755					476,911		332,016	144,895

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Treasure Island
State - Missouri

TABLE V
SUB-AREA SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production)			Future with project (Production)			Difference in net value
		Gross Value	Cost	Net Value	Gross Value	Cost	Net Value	
				ZONE A				
				NONE				
				ZONE B				
3	5,755	295,408	219,217	76,191	476,911	332,016	144,895	68,704
GRAND TOTAL	5,755	295,408	219,217	76,191	476,911	332,016	144,895	68,704

NOTE: Total project area reduced by 48 acres which is total water area.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Treasure Island
State - Missouri

TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/ GC to P (includes fencing)		60.00	20.00		80.00
Project					
W to GC GC to P	561	33,660	11,220		44,880
Total project		33,660	11,220		44,880
Annual amortized value 2/					2,459
Annual maintenance					-
Total annual cost of conversion					2,459

1/ W - woodland; GC - general dry-farmed crops; P - pasture
2/ Amortized at 5% for 50 years.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Treasure Island
State - Missouri

TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

	Soil mapping unit and land use	Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
3	General crops	5,180	31,650	2,540	3,652	6,192
	Permanent pasture	-	-	-	-	-
	Total	5,180 3/	31,650	2,540	3,652	6,192
GRAND TOTAL		5,180 3/	31,650	2,540	3,652	6,192

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 20 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Treasure Island
State - Missouri

TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	144,895	-
2. Net return without project	76,191	-
3. Gross benefit to project	68,704	61,869 1/
4. Farm drainage cost		
a. Installation cost	2,540	-
b. Maintenance cost	3,652	-
c. Total	6,192	6,192 2/
5. Conversion cost		
a. Installation cost	2,459	-
b. Maintenance cost	-	-
c. Total	2,459	2,459 2/
TOTAL ASSOCIATED COSTS	8,651	8,651

1/ Discounted amount reflects an estimated five year lag @ 5% (0.90051) to full benefit accrual.
2/ Instantaneous installation assumed.

PROJECT - LITTLE RIVER

SUB-AREA - DITCH 81

St. Francis River and Tributaries

(Missouri)

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch 81
State - Missouri

TABLE I
PRESENT LAND USE

Zone B

Soil mapping unit	Open	Wooded	Water	Total
	(Acres)	(Acres)	(Acres)	(Acres)
3	1,644	280	-	1,924
Project total - all soils	1,644	280	-	1,924
Water			-	-
GRAND TOTAL - Project	1,644	280	-	1,924

Basin - St. Francis River
and Tributaries
Project - Little River
Sub-area - Ditch 81
State - Missouri

SUMMARY TABLE II B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION
EXISTING CONDITIONS

Soil unit	Land use and crop distribution	Acres 1/	Production		
			Unit	Per acre	Total
All	Open land	1,644			
(3)	Crops	1,480			
	Cotton	148	Lbs.	250	37,000
	Cotton seed	(148)	Ton		33.30
	Corn	192	Bushel	25	4,800
	Soybeans	1,036	Bushel	20	20,720
	Grain Sorghum	104	Bushel	20	2,080
	Other land 2/	164			
	Woodland	280			
	Total	1,924			

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch 81
State - Missouri

SUMMARY - TABLE III B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITHOUT PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	1,644								
(3)	Crops	1,480								
	Cotton	148	Lbs.	290.0	42,920	0.24	10,301	83.52	12,361	316
	Cotton seed	(148)	Ton		38.63	61.50	2,376			
	Corn	192	Bushel	27.0	5,184	1.45	7,517	23.37	4,487	3,030
	Soybeans	1,036	Bushel	22.0	22,792	2.30	52,422	27.85	28,853	23,569
	Grain Sorghum	104	Bushel	22.0	2,288	1.53	3,501	20.06	2,086	1,415
	Other land 2/	164								
	Woodland	280	Acre			15.36	4,301	8.65	2,422	1,879
	Total	1,924					80,418		50,209	30,209

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm roads, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
Project - Little River
Sub-area - Ditch 81
State - Missouri

SUMMARY - TABLE IV B
(Zone for Drainage and Flood Control Calculations)
COMPUTATION OF AGRICULTURAL PRODUCTION, VALUE OF PRODUCTION, PRODUCTION COSTS, AND NET RETURNS: FUTURE CONDITIONS WITH PROJECT (Based on projected prices)

Soil unit	Land use and crop distribution	Acres 1/	Production			Value of production		Cost of production		Net return
			Unit	Per acre	Total	Per unit	Total	Per acre	Total	
						Dollars	Dollars	Dollars	Dollars	Dollars
All	Open land	1,924								
(3)	Crops	1,732								
	Cotton	693	Lbs.	450	311,850	0.24	74,844	117.52	81,441	10,664
	Cotton seed	(693)	Ton		280.67	61.50	17,261			
	Corn	346	Bushel	50	17,300	1.45	25,085	39.25	13,581	11,504
	Soybeans	693	Bushel	30	20,790	2.30	47,817	32.96	22,841	24,976
	Other land 2/	192								
	Total	1,924					165,007		117,863	47,144

1/ Parenthetical amounts are duplicated acreages.
2/ Farmsteads, farm road, waste and non-agricultural.

NOTE: Only one soil unit; therefore, table same as summary. This soil unit is No. 3.

Basin - St. Francis River and Tributaries
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TABLE V
SUB-AREA SUMMARY BY SOIL MAPPING UNITS

Soil unit	Acres	Future without project (Production)			Future with project (Production)			Difference in net value
		Gross Value	Cost	Net Value	Gross Value	Cost	Net Value	
				ZONE A				
				NONE				
				ZONE B				
3	1,924	80,418	50,209	30,209	165,007	117,863	47,144	16,935
GRAND TOTAL	1,924	80,418	50,209	30,209	165,007	117,863	47,144	16,935

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TABLE VI
LAND CONVERSION WITH PROJECT

Type of conversion	Total amount	Cost of clearing	Cost of smoothing	Cost of pasture establishment	Total cost
	Acres	Dollars	Dollars	Dollars	Dollars
Per acre					
W to GC 1/ GC to P (includes fencing)		60.00	20.00		80.00
Project					
W to GC GC to P	280	16,800	5,600		22,400
Total Project		16,800	5,600		22,400
Annual amortized value 2/					1,227
Annual maintenance					-
Total annual cost of conversion					1,227

1/ W - woodland; GC - general dry-farmed crops; P - pasture.
2/ Amortized at 5% for 50 years.

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TABLE VII
ANALYSIS OF FARM DRAINAGE SYSTEM COSTS

	Soil mapping unit and land use	Area	Total cost installation 1/	Annual equivalent cost 2/	Annual maintenance cost	Total annual cost
3	General crops	1,732	7,700	618	1,184	1,802
	Permanent pasture	-	-	-	-	-
	Total	1,732 3/	7,700	618	1,184	1,802
GRAND TOTAL		1,732 3/	7,700	618	1,184	1,802

1/ Includes engineering and contingency.
2/ Farm drainage for cropland amortized at 5% over 20 years. Maintenance costs are estimated to be high enough to produce this length of life.
3/ Not including 10% "other" for farmsteads, farm roads, waste and non-agricultural.

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TABLE IX
SUMMARY OF ANNUAL NET PRODUCTION RETURNS AND ASSOCIATED COSTS

Item	Total	Discounted amount
	Dollars	Dollars
1. Net return with project	47,144	-
2. Net return without project	30,209	-
3. Gross benefit to project	16,935	16,935 1/
4. Farm drainage cost		
a. Installation cost	618	-
b. Maintenance cost	1,184	-
c. Total	1,802	1,802 1/
5. Conversion cost		
a. Installation cost	1,227	-
b. Maintenance cost	-	-
c. Total	1,227	1,227 1/
TOTAL ASSOCIATED COSTS	3,029	3,029

1/ Instantaneous or less than 2 years installation and benefits.